Patent Scope

A STUDY

—

Matthew James Fisher

A dissertation submitted to the University of Bristol in accordance with the requirements of the degree of PhD in the Faculty of Social Sciences and Law

School of Law, December 2003.

Abstract

This thesis explores various aspects of patent scope in the U.K. in an attempt to answer two fundamental questions: First, what is the purpose of the patent system? And second, what breadth of protection best serves that purpose? It consists of nine Chapters spread over two Parts. Part I concerns historical and economic factors affecting the scope of patent protection in the U.K. It examines the birth of the English patent custom and the growth of the specification within it. The 'classical', (primarily 'reward', 'incentive' and 'natural rights' theories) and 'post-classical' justifications of the patent grant (including 'patent induced', 'prospect', 'race to invent' and 'rent dissipation' theories) are considered as well. Part I also contains results of an empirical study conducted by the author that looks into the claim drafting process from the point of view of the patent attorney (i.e. the person drafting the claims). Part II comprises three comparative studies and a review of recent case law in the U.K., with recommendations for reform. The other systems under consideration are those of America, Germany and Japan.

To my Mother and Father, for their eternal support.

Acknowledgements

I would like to thank the University of Bristol Faculty of Law (as it was) for the award of a scholarship to fund me through the first three years of study in connection with this work, and for supplementing my income with teaching provision. Without their faith (and money) the creation of this thesis would not have been possible. I would like to thank all of those within the School of Law (as it now is) that supported me throughout the completion of this work. With special thanks to Helen Norman, for her advice, support and friendship. I could not have wished for a better supervisor. In addition I would like to thank Cath, Henri and Mark for keeping me on the on the straight and narrow, and for their continued support.

Author's Declaration

I declare that the work in this thesis was carried out in accordance with the Regulations of the University of Bristol. The work is original, except where indicated by special reference in the text, and no part of the thesis has been submitted for any other academic award. Any views expressed in the dissertation are those of the author, except where indicated otherwise.

Signed: 

Date: 5th May 2004

Table of Contents

PART II

COMPARATIVE FACTORS

CHAPTER VI

AMERICA – PROMOTING THE 'USEFUL ARTS' 184

CHAPTER VII

GERMANY - A TRADITION OF EXPANSIVE INTERPRETATION 228

CHAPTER VIII

JAPAN - "AND WE SHALL HAVE PATENTS" 265

CHAPTER IX

Introduction
&
Chapter Structure

Patent protection of inventions forms the keystone upon which multi-billion pound industries are built across the World. Every patent application in the U.K. must contain a specification, which comprises "a description of the invention, a claim or claims and any drawings referred to in the description or any claim."[1] Claims define the invention for which protection is sought, and after grant their interpretation determines the scope of the monopoly that the patent confers.[2] Patents operate as a breakwater from competition, due to this effect their scope is of critical importance to the patentee, their competitors, and society at large.

In the United Kingdom, the principle at the core of the determination of patent scope is that the claims define the *outer* boundary of protection. They are utilised by the Patent Office in the determination of issues of patentability and by the Courts in matters of validity and infringement. Their interpretation, specifically the tests used for such a task, must therefore strike a delicate balance between the interests of the patentee and those of third parties.

In an ideal world the claims would be so clear and unambiguous that no dispute over their meaning would ever arise. But the world is not ideal; words are, by definition, multifaceted and layered with meaning. Human beings, themselves far from perfect, draft claims whist attempting to navigate through the treacherous waters bordered by the prior art. The words that they use to define the invention must be broad enough to prevent unscrupulous copying, yet narrow enough to avoid encompassing anything that has gone before. They describe an invention that may not be challenged for up to twenty years after the application is filed, at which point the patent should, in the eyes of the law, be as fresh as the day it was penned.

Against these obstacles it seems unfair that the patentee should be bound by the literal meaning of the words used to describe their invention, especially where obvious variants exist. The words in the claims are, however, all that the public and the patentee's competitors have to inform them of the scope of the monopoly grant; as such the interpretation that they enjoy must provide a degree of predictability in deference to legal certainty. As we shall see, convincing arguments can be made for

[1] Section 14(2) Patents Act 1977 (hereinafter PA 1977).

[2] Section 125(1) PA 1977.

both broad and narrow interpretations of the claims when determining the scope of protection of the patent. In the U.K. the Courts traditionally accept, some might say only pay lip service to, the idea that the protection offered by a patent cannot be restricted to the literal wording of the claims. They employ a single stage test in infringement proceedings, using purposive construction[3] to tread the fine line between fairness and certainty. Other jurisdictions utilise other means and their patents enjoy other scopes, some broader and some narrower than that in the U.K.

This thesis therefore sets out to explore various aspects of the determination of patent scope and to critically evaluate the current British position. It essentially asks two questions: first, what is the purpose of the patent system – i.e. how can the award of temporary monopoly to the creator of a new manufacture be justified? And second, what scope of protection best serves this purpose? In seeking the answer to these questions, the dissertation also asks whether the objective of harmonisation called for by the Protocol on the Interpretation of Article 69 of the European Patent Convention, and by international agreements such as TRIPs, is in fact misplaced. This author considers that the real question should not be one of conformity but rather predictability, and argues that this fundamental distinction is often overshadowed by a pseudo-Imperialistic idea of what predictability actually means. In developing this line of argument reference is made to historic, economic and comparative viewpoints, with the aim of providing the reader with a strong contextual platform from which to comment on the extant policy of claim interpretation in the U.K. and to provide a basis for recommending improvement. The discussion is essentially divided into two parts:

In Part I we consider some of the historical and economic factors that have shaped the British patent system and seek justification for its existence and explanation of its shape. We begin, in Chapter I, by exploring the 'typical' British approach to claim interpretation evidenced by decisions such as *E.M.I. v Lissen*,[4] *Van der Lely v Bamfords*,[5] and *Rodi & Wienenberger v Showell*[6] in the period up to the genesis of 'purposive

---

[3] Championed by Lord Diplock in *Catnic Components v Hill & Smith*, [1982] RPC 183 and restated by Hoffman J. in *Improver v Remington*, [1991] FSR 181.

[4] (1939) 56 RPC 23.

[5] [1963] RPC 61.

[6] [1969] RPC 367.

construction' in *Catnic Components v Hill & Smith.*[7] It establishes the position from which the rest of the thesis then advances and aims to provide the reader with relatively quick and easy access to the material developed in later Chapters. As such, it requires a certain 'leap of faith', and the reader may only see the circle completed upon re-reading it at the end. As noted, the real challenge with this Chapter was to set the scene as rapidly as possible and, considering the potential volume of material, it was reasoned that a more fact-based approach would be preferable to adopting true narrative style. Therefore, the Chapter is arranged around a series of quotations from a number of key cases, and as a consequence may appear a little 'extract heavy'. However, this approach was adopted in order to deliver the maximum information in the least possible space, and avoids inflating the Chapter out of all proportion to its place within the overall argument. In addition to setting the scene Chapter I also poses what is often considered to be the essential question when examining the determination of patent scope – what is the purpose of the patent?

In Chapter II we begin to search for the answer to this question and cast our attention back to the foundation of a patent custom in England. In doing so we seek the basis upon which the modern system is built, and explore the origins of 'monopoly phobia' arising from abuses of early grants. We therefore gain insight into the pedigree of the restrictive practices discussed in Chapter I. In addition, we consider the manner in which the patent system has developed in the U.K. and, in doing so, provide a base from which to argue that harmonised protection may not necessarily be in the best interests of all States at every point in their evolution. This is a matter to which we return in Part II during our comparative studies.

In Chapter III, we begin our exploration of patents within the market economy, and, using the 'Anti-Patent' Debate of the mid-19th century as our backdrop, discuss the 'Classical' justifications for the grant. Investigation of this period in British history also enables further exploration of the drive against monopoly and the rise of the *laissez faire* attitude that can be seen to colour early 20th century interpretation. This discussion also enables identification of what may be termed the 'key' differences that we perceive between the traditional British approach to claim interpretation and that which we see when looking at the German position in Chapter VII.

---

[7] See note 3, above.

Chapter IV continues our exploration of the economics of the patent system, incorporating the results of empirical research carried out by this author into the realities of claim drafting, and asks the question 'Does the philosophy fit the facts?' In conducting this investigation we see some of the other determinants of patent scope, separate from the courts' construction of the claims. This study enables us to evaluate the potential effects of modifying the courts' approach, and is a topic to which we return in the context of the comparative studies in Part II of the thesis.

In Chapter V we turn to look at some of the 'post-Classical' justifications that have been utilised in an attempt to explain the system and suggest a template for its optimum scope. In addition, we examine more closely the claim that all patents are monopolies, and also study some of the basic economics of supply and demand that lie at the core of the utility of the grant. In addition, a topology of invention is introduced that facilitates deconstruction of the argument that the patent system is good for all innovation, and enables us to discuss how variation in the interpreted scope of a patent may impact upon the type of invention that is encouraged. This, in turn, lays the foundation for a discussion of whether the essential questions posed in Chapter I are, in fact, essential at all. These are topics to which we return in Part II.

In Part II, we turn our attention to other jurisdictions in order to reflect upon wildly differing traditions of interpretation within the classic trinity of developed patent systems. Thus, in Chapter VI we begin this process by examining the U.S. approach to determining patent scope, paying particular attention to the 'Doctrine of Equivalents' as broadening the effect of the patentee's 'monopoly' from the literal wording of the claims. The limits placed on the operation of the doctrine, particularly the application of 'file-wrapper estoppel', are also considered in order that a full picture may be gained.

In Chapter VII, we move our focus a little closer to home and examine the German patent system. The German approach to claim interpretation is traditionally perceived to be diametrically opposed to that in the U.K., and therefore provides excellent illustration of the tensions within the European Patent system, the second of our classic three. It also enables us to question the impact of the Protocol on the Interpretation of

Article 69, and to ask whether the idea of harmonisation is, in fact, desirable as an end in itself.

To end our discussion of other systems, we move to Japan. Therefore, in Chapter VIII, we note the nation's meteoric rise from technological obscurity in the mid-19th century to the electronic 'whiz-kid' of today, and explore the role that patents played in this process.

Ultimately we return home, and in Chapter IX examine the post-*Catnic* approach to claim interpretation in the U.K., assessing this position in the light of the foregoing discussion, before finally concluding and suggesting that it may be time to 'correct' some of the more obvious discrepancies of the test.

Methodology

General Methodology

The law of patents provides fertile ground for any researcher. The sheer breadth of subject matter and size of the economic interests involved in the patent 'game' ensures that study in this area is never free of controversy, disagreement and debate. However, the starting point of any study is the selection of a topic, and then material, that is considered to be manageable in relation to the proposed aims of the project. The volume of sources, both primary and secondary, available to the researcher of the patent system is truly vast, I therefore chose a topic that interested me and on which I felt that I had strong opinions. During the course of the study my opinions changed as my understanding grew, and the position taken in relation to the material that I consider bears little relation to my original thoughts on this topic. Indeed, the final structure of the thesis is almost completely detached from my original idea of how it would progress.

The idea for this work grew from comments made by Brad Sherman in *Patent Claim Interpretation: The Impact of the Protocol on Interpretation*, *(1991) 54 MLR 499*, that "a detailed theoretical, historical and empirical examination of patent interpretation"[1] was needed in order to end speculation over the practices that led to the current shape of the law in this area. It was originally my idea to look at theories and practices of claim interpretation in the U.K. and America only, additionally considering the problem faced by 'broad claims', particularly in the biotechnology industry.

I began by reading, casting my net purposefully wide in order to assess whether the material that I perceived I would be dealing with would provide sufficient basis for the formulation of a PhD. I therefore visited numerous libraries, most usefully the Bodleian, and St. Peter's College Library in Oxford, the Library of the Institute of Advanced Legal Studies and the British Library in London, and also utilised the services of the Law Library in the University of Bristol. For the first few months of my study I did little but read, and it soon became apparent that my initial approach would be both over general and too narrow.

[1] At 509.

The problem was two-fold: First, by limiting my study to the U.K. and America, I was excluding two very important (from both a comparative and economic point of view) jurisdictions, Germany and Japan. Second, by extending to consider the problem of broad claims I risked dilution of the core of the investigation. In addition, it was apparent that adding Germany and Japan to the equation necessarily required some degree of loss elsewhere in order that the project did not mushroom out of all control. The decision was therefore taken to remove the issue of broad claims as a discrete entity from the thesis. However, even at this early stage it was my intention to include empirical work based on interviews with members of the claim drafting profession, and it was considered that this would allow investigation of the issue of broad claims within a manageable framework.

Therefore, with this new structure in mind I returned to the library. In addition, by virtue of a new site subscription to Westlaw I was able to access far more material than previously. This presented both benefits and disadvantages. The benefit was that I was no longer reliant on indexes of legal periodicals, therefore avoiding being subject to other peoples' classification of material, and now could conduct my searches in full text online. However, the main disadvantage was the sudden increase in the volume of material that I was faced with. By this time I was reasonably proficient at distinguishing between good, bad and indifferent material, but the potential scope of the sources that I was now faced with was a little daunting at times.

At this point in time, I had a reasonably well-formed idea of the content that I wished to investigate, although not the structure that I wished to adopt. Therefore I set about researching what I considered to be the most easily confinable and least changeable area of the study, the History of the Patent System in the U.K. I began writing in the spring of my first year, but at this time I was having significant problems contextualising the Chapter, and seeing its position in the whole. I knew that the material within it was important, but I could not yet see how to best structure it so as to fit in with other Chapters. Therefore I moved to consideration of the American system. This piece was to form the basis for my upgrade from LLM by Research to Ph.D.

Upon completion of the American Chapter, I moved to consider the economics of the patent system, and found myself entangled once more in historical considerations of the

nature and function of the patent grant. In the summer of my second year I began to write what was initially intended to be a single Chapter on Patents within the Market Economy. However, it soon became apparent that this topic was destined to fulfil a far greater role in my overall thesis than originally imagined. Thus one Chapter became three, and I was finally able to assess the eventual structure of the thesis. By breaking the Chapter into three I was able to integrate the results of my empirical study[2] more fully into the text by contrasting the theoretical aims, purposes and justifications of the patent grant with the practical realities of the system in operation. This approach also enabled me to place the historical Chapter in context, and upon completion of the three economic Chapters I returned to rewrite the history in a manner that integrated more fully with the thesis as a whole.

Therefore, with a clear structure in mind I was now able to focus on the comparative aspects of the thesis. I was aware from the start how difficult it would be to access materials in Japanese and German, as I speak neither of these languages. It was this factor that first caused me to exclude these jurisdictions from my study, but during the course of the interviews that I conducted with patent attorneys in relation to the empirical part of the thesis, it quickly became apparent that they could not be ignored. Therefore I bit the bullet and began collecting the material that I required. The Japanese Chapter was, contrary to my expectations, relatively straightforward to investigate. The Japanese Patent Office website provided a wealth of information and additionally there are a number of English language publications and web sources that deal with the material in which I was interested. I was also fortunate enough to be able to discuss the practicalities of the Japanese system both with U.K. patent attorneys who had significant experience of dealing with it, and also with Japanese patent attorneys visiting the U.K. However, despite being relatively straightforward, it was nonetheless very time consuming gathering the information required, and it was during this period of research that I utilised the Inter-Library Loans Service most heavily.

The German material was far more difficult to access. The International Review of Industrial Property and Copyright Law (the IIC) published by the Max Planck Institute was most useful in the preparation of this Chapter. However, it was often the case that translations of judgments would not appear until some years after the decision, this

[2] The methodology of the empirical study is discussed fully below.

necessarily hampered my investigation as I was constantly operating at least 12 months behind current events. Other than this, a number of web sources and articles in 'mainstream' IP journals provided sufficient material for the completion of the Chapter. The harmonisation effected by the Protocol on the Interpretation of Article 69 EPC, and evidenced by a number of recent judgements of the *Bundesgerichtshof* that refer to and apply the *Catnic* test, rendered the investigation in this Chapter largely historic anyway, thereby limiting the effect of late-coming judgment text.

The Empirical Study

During a number of conversations with Professor Gwynn Davies[3] before commencing on the plan of the empirical study it was decided that given the subject matter under consideration it would be more beneficial to proceed by way of interview rather than questionnaire. The reasons for this were primarily two-fold. First it was considered that the nature of the investigation was best effected by means of open questions, designed to elicit opinion rather than knowledge *per se.* In addition, the scope of the study and intended outcomes were such that it was felt beneficial to let the subject talk around the specific subject matter rather than providing specific answers to set questions. Secondly it was feared that the possibility of a small response rate might render the administration of a questionnaire both statistically and practically useless.

The patent attorney was selected as a subject primarily due to the close affinity that the profession has with the creation of the patent claims, and therefore their connection with the first stage in the determination of the scope of protection. The profession was also chosen due to the strong, dipolar views held by certain members of the community, primarily evidenced in their writings on the subject.

The website of the Chartered Institute of Patent Attorneys (CIPA) was utilised in order that a list of potential practices could be drawn up. Due to considerations of time and expense the list was limited to attorneys in Bristol and London. An initial list was created that contained 55 practices. In the first instance a letter, *pro-forma* and stamped addressed return envelope were sent out to the practices on the list.[4] The letter explained the context of the study. It stated that the traditional analysis of the

---

[3] Professor of Socio-Legal Studies at the University of Bristol.

[4] The letter is reproduced in Appendix A, below. The *pro-forma* is reproduced in Appendix B.

construction of a patent completely was perceived to divorce the drafting from the *ex post facto* analysis of the Courts and therefore failed to take into account the crucial role that the patent attorney performs in bridging the gap between the patentee and the public. It gave an indication of the area of interest by virtue of a number of points upon which clarification or explanation was sought. These points included an investigation into the way in which a patent is put together covering the thought processes and the procedures that are entailed in the drafting of the specification and the wording of the claims. Further the thoughts of the agents were sought on the best method of interpretation of the claims as they saw them, it was considered that this may be different from the detached analysis placed upon claim interpretation by legal and economic academics. The purpose of the letter was to both introduce the topic and to provide a handle upon which to base the intended interviews.

The letter additionally asked whether the patent attorney in question would be prepared to meet with the author in order to discuss the issues raised and to further explore the subject of claim drafting. Confidentiality was assured.

A *pro-forma* included with the letter asked for the name of the agent with whom contact should be made in order to arrange an interview, the number of partners/fee earners in the firm and also for a contact number. In addition it asked for a description of the area of technological expertise of the person with whom the interview may be arranged.

Of the 55 letters sent out replies were received in 28 cases, a percentage significantly higher than expected. However 8 were to decline the possibility of an interview and 4 were letters stating that at present the firm in question was not in a position to take on additional staff.[5] The remaining 16 replies were favourable. Due to travel and time constraints it was decided that 8 of these would be approached for interview.

Over the following months 8 interviews were arranged with a variety of attorneys, some in Bristol and some in London. The subjects were chosen from different sized firms and with specialisation in different areas of technology ranging from computer software

[5] The apparent inability of these recipients to actually read the letter sent to them did, in any case, not bode well for the attention that they would have lavished on the drafting of the claims. Their timely exit from the interview process was, perhaps, of no great loss.

and biotechnology, through pharmaceuticals and general chemical to mechanical and electrical engineering. The interviews lasted for between one and two hours. They took place in the attorney's place of work, all were tape recorded and later transcribed. The results form the basis of Chapter VI of the thesis.

PART I

-

HISTORICAL & ECONOMIC FACTORS

CHAPTER I

The British 'Tradition'

Basic Claim Theory

There are two, essentially binary, positions that can be adopted concerning the significance that the claims are given in the determination of a patent's scope of protection. These overarching classifications are often termed 'peripheral definition theory' and 'central definition theory', and all subsequent interpretation is subordinate to this primary categorisation of approach.[1]

The basic difference between the two lies in the role that the claim plays in defining protection. Under 'peripheral definition theory' the claim(s) define the outer boundary. They form the linguistic equivalent of 'fence-posts' penning in the monopoly territory and marking its outer limits. The major advantage of this approach is that the scope of protection is relatively clear to third parties, providing certainty to the grant. Under 'central definition theory', on the other hand, the scope of protection is determined by finding the principle underlying the invention (the 'inventive idea') by looking at the teaching in the specification as a whole. The claims may be the starting point for the assessment, however courts are not strictly bound by their wording. This has the advantage of providing a fairer degree of protection for the patentee (as patent scope is decided based upon contribution to the art), but suffers in terms of certainty.

Typical examples of countries adopting the different forms of claim theory are, respectively, Britain and Germany. For many years the latter treated the claims as guidelines only, basing the scope of protection primarily on what the disclosure in the description would have taught the skilled addressee.[2] The British approach typifies peripheral definition theory, with claims staking the outer limits of protection. The rationale for the adoption of the different approaches in these States is largely historical. In Britain, it has been linked to the "niceties of the Chancery mind accustomed to the *ex*

[1] These theories are given a fuller treatment in Chapter VI (below) when discussing the evolution of the American patent system. See also, Takenaka, *Interpreting Patent Claims: The United States, Germany and Japan*, Vol. 17 Studies in Industrial Property and Copyright Law (1995; Max Planck Institute for Foreign and International Patent, Copyright and Competition Law, Munich) (hereinafter Takenaka, *Interpreting Claims*) at 3-12.

[2] See further Chapter VII, below.

post facto analysis of conveyances, trusts and wills,"[3] legal positivism also shares the blame.[4] In Germany, the more 'open' approach to interpretation has been attributed to the influence of theorists advocating the *Interessenjurisprudenz*, whereby it was argued that the interpretation of documents should be carried out with the interests of the parties in mind, here primarily the patentee.[5] In other words, the different approaches can be traced back to critical differences between British and German legal thought. As we shall see in later Chapters, the choice of theory is also affected by philosophical and economic rationalisation of the justifications for the patent grant.[6] Although such arguments initially operated to explain rather than give basis for the award of the patent monopoly, their impact on the minds of the judiciary is clear. Therefore, German courts often state that the primary justification for the patent system is that it gives 'just reward' to the inventor,[7] whilst British courts have often stated that the grant is justified on the basis that it provides incentive to invent.[8] The repercussions that this distinction has for the scope of the patent are covered in more detail in later Chapters, however, for the present it is interesting to note that the focuses of the two explanatory theories lie on opposite parties in the grant. Therefore, whilst the 'reward theory' concentrates on adequate remuneration for the patentee, the 'incentive theory' pays more attention to the interests of society.

The Traditional British Approach

The traditional British approach to claim interpretation finds its basis in s.5(5) of the Patents Act 1883. This required that "a specification, whether provisional or complete, must commence with the title, and in the case of a complete specification must end with a distinct summary of the invention claimed." The practice of inserting a specification

---

[3] Norman, *Determining the Scope of the Patentee's Monopoly: Purposive Construction Revisited, [1998] Anglo-American Law Review 221* at 223.

[4] Sherman, *Patent Claim Interpretation: The Impact of the Protocol on Interpretation, (1991) 54 MLR 499* at 508.

[5] See Sherman, *Ibid.* See further, Bredimas, *Methods of Interpretation and Community Law* (1978; Elsevier North-Holland, New York).

[6] See further, Chapters III, V and VII, below.

[7] See, for example, text accompanying note 54 *et seq.* in Chapter VII below.

[8] See, for example, the comments of Lord Oliver in *Asahi Kasei Kogyo, [1991] RPC 485* at 523 where he states that: "The underlying purpose of the patent system is the encouragement of improvements and innovation."

detailing the claimed invention had been common practice since the mid-18th century,[9] however the 1883 Act was the first to make the provision of claims a statutory requirement. It is apparent, though, that this formal inclusion of claims in fact prompted little, if any, change in the way in which specifications were drafted.[10] Indeed, as Lord Chelmsford had stated some seven years previously, the "office of a claim is to define and limit with precision what it is which is claimed to have been invented and therefore patented."[11] Even before the passage of the 1883 Act, therefore, the British approach to determining the scope of protection of a patent was based on the 'peripheral definition' theory, with the claims forming the outer boundary of protection. The rules that were used to interpret the claims, and to decide whether an alleged infringer operating on the periphery of the grant in fact fell within the scope of the monopoly, were "very straightforward and very simple."[12] The starting point was the principle of literal interpretation. The method to be undertaken was aptly summarised by Lord Esher in 1894:

> "[W]hen objection is taken to the claim, or to any one of several claims, it is not using the true canons of construction to read that alone and to say that, without regard to what there is in the rest of the patent, that means so-and-so, or that means what is stated as the objection, and therefore, reading it in that way, you must hold the patent is bad. You must look at the whole of the Specification, and then, having looked at the whole, if it is an objection to the claim, see what the claim, on the true construction of it is, having regard to the whole of the instrument."[13]

However, Romer LJ, later cautioned against over-use of the specification to alter the clear and unambiguous meaning of a claim:

> "One may, and one ought to, refer to the body of the Specification for the purpose of ascertaining the meaning of words and phrases used in the Claims or for the purpose of resolving difficulties of construction occasioned by the Claims when read by themselves. But where the construction of a Claim when read by itself is plain it is not in my opinion legitimate to diminish the ambit of the monopoly claimed merely because in the body of the Specification the Patentee has described his invention in more restricted terms than in the Claim itself."[14]

---

[9] See further Chapter II, below.

[10] See Kemp, *Claim Drafting: An Historical Survey*, in Kemp (ed), *Patent Claim Drafting and Interpretation*, (1983; Oyez Longman, London) (hereinafter Kemp, in Kemp) at 17.

[11] *Harrison v Anderston Foundry Co.*, *(1875-6) 1 App Cas 574* at 581.

[12] Jacob, *Interpretation of Claims and Infringement*, in Vittoria (ed), *The Patents Act 1977*, (1978; Sweet & Maxwell, London) at 65.

[13] *Edison Bell Phonograph Corporation v Smith*, *(1894) 11 RPC 389* at 395.

[14] *British Hartford-Fairmont Syndicate Ltd v Jackson Bros (Knottingley) Ltd*, *(1932) 49 RPC 495* at 556.

For such practice "would not be to construe but to amend..."[15] Therefore, given that claims formed the outer limits of protection, infringement could still depend on whether their wording was broad or narrow, technical or general.[16] Particular problems were caused by competitors 'inventing around' the patent by producing functional equivalents to claim integers.

Under a literal interpretation, if one or more of the 'essential elements' of the patentee's claims was omitted or replaced by mechanical equivalents then infringement would not be forthcoming. The reason for limitations in the claim was unimportant, the principle of legal certainty dictated that protection should be restricted to their precise wording and no more.

This approach to construction is epitomised by the judgment of Lord Russell of Killowen in *Electrical and Musical Industries Ltd., v Lissen Ltd.*[17] The following passage, although not endorsed by a majority of the House in the case itself, is often recited as an accurate statement of the law.[18]

> "The Court of Appeal have stated that in their opinion no special rules are applicable to the construction of a specification, that it must be read as a whole and in the light of surrounding circumstances, that it may be gathered from the specification that particular words bear an unusual meaning, and that, if possible, a specification should be construed so as not to lead to a foolish result, or one which the patentee could not have contemplated. They further have pointed out that the claims have a particular function to discharge. With every word of this I agree, but I desire to add something further in regard to the claims in a specification.
>
> The function of the claims is to define clearly and with precision the monopoly claimed, so that others may know the exact boundaries of the area within which they will be trespassers. Their primary object is to limit and not to extend the monopoly. What is not claimed is disclaimed. The claims must undoubtedly be read as part of the entire document and not as a separate document; but the forbidden field must be found in the language of the claims, and not elsewhere. It is not permissible, in my opinion, by reference to some language used in the earlier part of the specification to change a claim which by its own language is a claim for one subject-matter into a claim for another and a different subject-matter, which is what you do when you alter the boundaries of the forbidden territory. A patentee who describes an invention in the body of a specification obtains no monopoly unless it is claimed in the claims. As Lord Cairns said, [in *Dudgeon v Thomson (1877) 3 App Cas 34*] there is no such thing as infringement of the equity of a patent."[19]

---

[15] Thorley (ed), *Terrell on the Law of Patents*, (2000; Sweet & Maxwell, London; 15th Ed) (hereinafter Terrell) at 6.37.

[16] The factors influencing the intrinsic scope of the patent (i.e. the scope with which it is drafted) are discussed more fully in Chapter IV, below.

[17] *E.M.I. v Lissen, (1939) 56 RPC 23*. Lord Russell's speech can be found at pages 39 to 46.

[18] See similar assertions in Terrell, *op cit.* at 6.38. Also Kemp, in Kemp, *op cit.* at 19.

[19] *(1939) 56 RPC 23* at 39.

Pressing the point, he continued:

> "I know of no canon or principle which will justify one in departing from the unambiguous and grammatical meaning of a claim and narrowing or extending its scope by reading into it words which are not in it; or which will justify one in using stray phrases in the body of the specification for the purpose of narrowing or widening the boundaries of the monopoly fixed by the plain words of a claim.
>
> A claim is a portion of the specification which fulfils a separate and distinct function. It and it alone defines the monopoly; and the patentee is under a statutory obligation to state in the claims clearly and distinctly what is the invention which he desires to protect."[20]

Exceptions to the General Rule

However, Lord Russell's formulation clearly does not apply where the wording was not "unambiguous", or where a literal interpretation would produce a manifestly foolish result. This is certainly the interpretation placed on the case by Lord Evershed M.R. in *Rosedale Associated Manufacturers v Carlton Tyre Saving Company* when he states:

> "It is no doubt true and has been well established (see for example, the speech of Lord Russell of Killowen in the E.M.I. case [citation omitted] that you must construe the claims according to their terms upon ordinary principles, and that it is not legitimate to confine the scope of the claims by reference to some limitation which may be found in the body of the specification but is not expressly or by proper inference reproduced in the claims themselves. On the other hand, it is clearly no less legitimate and appropriate in approaching the construction of the claims to read the specification as a whole. Thereby the necessary background is obtained and in some cases the meaning of the words used in the claims may be affected or defined by what is said in the body of the specification."[21]

In addition, as Kemp notes, Lord Russell's speech must be seen in the context of the Patent Office's requirements that "the body of the specification... be consistent with the claims thereby to render in general less chance for the specification... [to contain] 'stray phrases... for the purpose of narrowing or widening the boundaries of the monopoly fixed by the plain words of the claim'."[22]

The classic example that is utilised as an exception to the 'standard' approach advocated by Lord Russell is the case of *Henriksen v Tallon*.[23] The dispute concerned a patent for a ball point pen having a plug in contact with the ink at the open end of the tube. The claims specified:

---

[20] *Ibid.* at 41

[21] *[1960] RPC 59* at 69.

[22] Kemp, in Kemp, *op cit.* at 19.

[23] *[1965] RPC 434*.

> "a fountain pen of the ball tip type, comprising a tubular ink reservoir provided at one end with a ball tip and at the opposite end with an air inlet, in which there is disposed between the column of ink in the reservoir and the air inlet a liquid or a viscous or paste-like mass which does not mix with the ink and forms a plug which moves with the surface of the ink column *and prevents air from contacting the surface of the ink.*"[24] (emphasis supplied).

The alleged infringement contained a grease plug between the ink and air inlet that did not mix with the ink to any appreciable extent, and which moved with the surface of the ink column. However, expert evidence demonstrated that the defendant's plug only prevented some 60% of the air from contacting the surface of the ink. Therefore, the question of construction that lay before the Court related to the interpretation of "prevents" in the claims.

The House of Lords, unanimously considered that "prevents" in the patent claims must be interpreted as meaning "prevents for all practical purposes", although Lord Guest disagreed with the majority over whether the plaintiff had successfully proved that the defendant's embodiment fulfilled this requirement.[25] Lord Reid was the most forthright of their Lordships, stating that:

> "It is a general principle of construction that, where there is a choice between two meanings, one should if possible, reject that meaning which leads to an absurd result... It would be a very artificial construction of the claim to hold that, because an infringer's plug is not very efficient though sufficient for commercial purposes, therefore there is no infringement. That would simply be inviting infringers to take the invention but make it work inefficiently."[26]

The 'Pith and Marrow'

In addition to these principles, it was clear that protection extended to so-called 'colourable', or immaterial, variations of the claimed invention. In deference, perhaps, to the fact that "[o]utright and forthright duplication is a dull and very rare type of infringement,"[27] the doctrine of 'pith and marrow' grew up alongside the patent grant to soften the effect of a purely textual interpretation. This 'mixed metaphor' appears to

---

[24] Claim 1 of the patent.

[25] See the final paragraph of Lord Guest's judgment (on page 453 of the report).

[26] *[1965] RPC 434* at 443, 445.

[27] Per Justice Jackson, delivering the leading judgment in *Graver Tank v Linde Air Products*, *339 U.S. 605*, at 607.

have been coined by Lord Cairns, the Lord Chancellor, in *Clark v Adie* when he stated that:

> "The infringer might not take the whole of the instrument here described, but he might take a certain number of parts of the instrument described; he might make an instrument which in many respects would resemble the patent instrument, but would not resemble it in all its parts. And there the question would be ... whether that which was done by the alleged infringer amounted to a colourable departure from the instrument patented, and whether in what he had done he had not really taken and adopted the substance of the instrument patented. And it might well be that if the instrument patented consisted of twelve different steps, ... an infringer who took eight or nine or ten of those steps might be held by the tribunal judging of the patent to have taken in substance the *pith and marrow* of the invention, although there were one, two, three, four or five steps which he might not actually have taken and represented upon his machine."[28] (emphasis supplied)

As Kemp notes: "While the metaphor has been criticised the principle enunciated in *Clark v Adie* ... has been followed and applied in many cases".[29] Subsequent decisions refined the principles laid down in the case and, in particular, made explicit Lord Cairns' implicit reference to the doctrine of mechanical equivalency. Thus, in *Marconi v British Radio Telegraph and Telephone Company Ltd.*, Parker J referred to the doctrine of 'pith and marrow' in the following terms:

> "It is a well-known rule of Patent law that no one who borrows the substance of a patented invention can escape the consequences of infringement by making immaterial variations. From this point of view the question is whether infringing apparatus is substantially the same as the apparatus said to have been infringed ... where the Patent is for a combination of parts or a process, and the combination or process, besides being itself new, produces new and useful results; everyone who produces the same results by using the essential parts of the combination or process is an infringer, even though he has, in fact, altered the combination or process by omitting some unessential part or step and substituting another part or step, which is, in fact, equivalent to the part or step he has omitted."[30]

Therefore, by the early 20th century it was firmly established that the patent grant extended to protect against embodiments that, although they omitted certain features or substituted equivalent means for them, nonetheless took the essence of the invention. However, it was equally clear that this extension of protection was only available where the variations or omissions were in respect of *inessential* features of the invention. Therefore, the key issue in infringement proceedings became whether particular limitations in the claims were of this nature or not.

---

[28] *(1876-7) 2 App Cas 315* at 320.

[29] Kemp, in Kemp, *op cit.* at 20. He continues, listing some of the cases in which favourable reference has been made to *Clark v Adie.*

[30] *(1911) 28 RPC 181* at 217.

The importance, and difficulty, of making the distinction (as well as affirmation of the existence of the doctrine, which Kemp notes had lain dormant since the decision of the Privy Council in *Pope v Spanish River*[31]) finds illustration in comments of Lord Evershed MR, in *Birmingham Sound Reproducers Ltd., v Collaro.*

> "In our judgment, it is not open to this court or the authorities to accept that Sir Lionel's submission to the effect that the doctrine of 'pith and marrow' or 'substance' is dead. Nor do we propose to attempt any comprehensive definition of its scope. We think it can, generally speaking, be taken to be confined to unessential differences, though we appreciate that the distinction between that which is essential and that which is unessential may be difficult to draw...
>
> The invention with which we are now concerned is an invention consisting of the selection of particular known mechanical members and the arrangement of them in a particular way ... The individual parts of this apparatus are not claimed as inventions and ... could not be so claimed. The basic idea which it carries out ... is not new.
>
> Thus the essence of the invention resides wholly in the selection and arrangement of the parts and the manner in which they interact when arranged in accordance with the invention. *It is therefore essential to the invention that it should consist of the particular parts described in the claim arranged and acting upon each other in the way described in the claim.*
>
> The question therefore appears to be whether the allegedly infringing apparatus consists of substantially the same parts acting upon each other in substantially the same way as the apparatus claimed as constituting the invention. It is *not enough* to find that the parts comprised in the Respondent's apparatus individually or collectively perform substantially similar functions to those performed individually or collectively by the parts comprised in the apparatus claimed as the appellant's invention, or that the Respondent's apparatus produces the same result as the Appellants' apparatus. *It must be shown that the Respondent's selection and arrangement of parts is substantially the same as the Appellant's selection and arrangement of parts, for it is in such selection and arrangement that the Appellant's invention resides.*"[32] (emphasis supplied)

Therefore, under the renewed doctrine little had changed: The courts still had to analyse the patent in order to establish the essential elements, and then assess whether the defendant's embodiment reproduced each of these. It was not enough to show equivalent functionality, the doctrine required identity in essence, only inessential elements could be substituted or omitted.[33]

Applying the Test

The potential for this approach to provide a narrow, almost literal, interpretation of the claims, restricting the scope of protection to "dull and very rare" cases of "outright and forthright duplication", is illustrated by two House of Lords Decisions of the 1960s.

---

[31] *(1928) 46 RPC 23*. See Kemp, in Kemp, *op cit.* at 22.

[32] *[1956] RPC 232* at 244 and 245.

[33] As will be seen, (in Chapter VI, below) this bears close resemblance to the 'all element rule' under U.S. patent law.

The first is *Van der Lely v Bamfords*,[34] which concerned a patent for a mechanical 'hay rake' cum 'swathe turner'. The transformation from one function to the other was facilitated by the "rake wheels situated hindmost in the direction of motion" being "separately or jointly dismountable" and mountable "adjacent the foremost rake wheels".[35] The crux of the infringement action related to whether, by specifying that the hindmost wheels be dismountable, the patentee had limited the scope of their patent to exclude situations where the foremost wheels could be removed and aligned adjacent the hindmost rake wheels, achieving the same advantage.

At first instance, Lloyd-Jacob J had remarked:

> "In the present case, no passage in the specification can be found to support the suggestion that removal of any but the hindmost wheels was ever in the contemplation of the inventor. Save for the ingenuity of the defendants in producing their device, it is unlikely that any reader of the specification would have appreciated that the transposition in Claim 11 of the words 'hindmost' and 'foremost' would be required to identify the useful conversion of a particular raking device, and still less that to suppose that the Patentee so intended."[36]

Therefore, when deciding the issue of infringement, he declined to depart from the clear and unambiguous wording of the claim. Stating that:

> "If the Patentee had in fact appreciated that a vehicular frame could be devised which permitted conversion from side raking to swathe turning by retention in position of the hindmost rake wheels of the original row, *it is inconceivable that he would have framed this claim in language which expressly calls for their removal.*"[37] (emphasis supplied)

By parity of reasoning, the majority in the Court of Appeal also refused to find that the patent had been infringed, Upjohn LJ adding:

> "...Why they so confined the claim it is not for us to speculate. The claim could presumably have been safely drawn to cover dismountability of either group [of wheels] ... but apparently the appellants did not appreciate this possibility... [T]here is no escape ... we are bound to construe the words of the claim according to their clear and unambiguous meaning."[38]

---

[34] *[1963] RPC 61*.

[35] See Claim 11 of the patent, reproduced in Lord Reid's speech at page 74 of the report, *ibid.*

[36] *[1960] RPC 169* at 197.

[37] *Ibid.*

[38] *[1961] RPC 296* at 313.

The case was appealed to the House of Lords where the majority, once again, declined to find infringement on grounds that the patentee had deliberately limited their claim to dismountable hindmost wheels. We shall turn to examine the reasoning of the majority on the issue of claim interpretation in due course, however, for the moment it is interesting to examine the dissenting opinion of Lord Reid, standing alone in his finding of infringement.

Lord Reid took a practical view of the invention. After stating that the defendant clearly avoided textual infringement of the claim by providing dismountable foremost wheels rather than hindmost wheels as required by the patent, His Lordship continued to assess the scope of the doctrine of 'pith and marrow'.

> "Copying an invention by taking its 'pith and marrow' without textual infringement of the patent is an old and familiar abuse which the law has never been powerless to prevent. It may be that in doing so there is some illogicality, but our law has always preferred good sense to strict logic."[39]

He continued, explaining that this 'illogicality' arises due to the fact that the patentee is strictly tied to the invention as claimed. Therefore, if another effects the same improvement by other means this should not infringe. However, he also noted that:

> "...[I]t has long been recognised that there "may be an essence or substance of the invention underlying the mere accident of form; and that invention, like every other invention, may be pirated by a theft in a disguised or mutilated form, and it will be in every case a question of fact whether the alleged piracy is the same in substance and effect, or is a substantially new or different combination.""[40]

Therefore, what was critical in this case was the fact that the defendant was unable to point to any mechanical reason for, or advantage to, making the foremost wheels dismountable. "It is simply done to try to evade the claim."[41] He further commented on the reasoning of the lower courts, stating that:

> "It must be true ... that in framing their specification the appellants did not appreciate that the same result could be achieved by moving the foremost wheels, for otherwise they would have made their claim wide enough to cover this. But surely the same must be true of most if not all cases where there is an attempt to avoid infringement by the substitution of a mechanical equivalent: if the patentee had foreseen that possibility he would have made his claim cover it. If that were a good reason for refusing protection to the patentee against a person who later thinks of and adopts the mechanical equivalent, it seems to me that there would be very little left of this principle. Upjohn, L.J., said that the appellants "have deliberately chosen to make

---

[39] *[1963] RPC 61* at 75.

[40] *Ibid.* Quoting from the judgment of James LJ in *Clark v Adie, (1873) LR 10 Ch 667*.

[41] *[1963] RPC 61* at 75.

> it an essential feature of the claim that the hindmost wheels should be detachable." If by that he meant that there is something in the specification to show that they deliberately refrained from including the foremost wheels or went out of their way to make the hindmost wheels an essential feature I cannot find anything on which to base such a conclusion. But I do not think that he meant that, because he went on to agree with Lloyd-Jacob, J., that apparently the appellants did not appreciate the possibility that the foremost wheels might be moved. So I think that he must have meant that the mere fact that they only mentioned the hindmost wheels was sufficient to make the limitation to the hindmost wheels an essential feature of the claim. But if that were right, then I cannot see how there could ever be an unessential feature or how this principle could ever operate. And I think that the principle is very necessary to prevent sharp practice."[42]

It is therefore apparent that Lord Reid considered the fact that the patentee failed to mention any other embodiment as insufficient evidence that they therefore *intended* to exclude other embodiments from the scope of protection. His construction is based on what the patentee could validly have claimed. His Lordship appears to appreciate the impossibility of drafting a claim that encompasses all potential variants from the outset. This approach can be seen to match the scope of protection to the patentee's contribution to the art. As such, it appears that Lord Reid adopts a reward-based justification for the interpretation that he places on the claims. However, the integrity of his approach is somewhat compromised by the fact that everything in his judgment reflects His Lordship's opinion that the defendant had consciously sought to copy the patentee's product whilst avoiding a textual infringement. This latter factor tends to suggest that whilst intention of the patentee cannot be assumed from their choice of limiting words, it may be assumed from the inability of the defendant to explain their own choice of elements. A solution to this problem could be found by adopting the position that the patent is assumed to cover all embodiments made obvious to the skilled addressee in the light of the claims. However, this would come perilously close to adopting central definition theory.

As noted, Lord Reid was in the minority on the issue of claim interpretation. The majority held the view that the patentee had deliberately elected to limit the claim to 'dismountable hindmost wheels'. Therefore, even under the doctrine of 'pith and marrow' there could be no infringement. Viscount Radcliffe explained that the application of the principle:

> "...is from first to last directed to the prevention of abuse of patent rights by colourable evasion: it is not a special or 'benevolent' method of construing an

[42] *Ibid.* at 76-77.

> uncertain claim ... [T]he basic duty of the patentee [is] to state clearly what is the invention for which he seeks protection...
>
> When, therefore, one speaks of theft or piracy of another's invention or says that it has been 'taken' by an alleged infringer and this 'pith and marrow' principle is invoked to support the accusation. I think that one must be very careful to see that the inventor has not by the actual form of his claim left open to the world the appropriation of just that property that he says has been filched from him by piracy or theft. *After all, it is he who has committed himself to the unequivocal description of what he claims to have invented, and he must submit in the first place to be judged by his own action and words.*
>
> If he is so judged, I cannot for my part see what inventive idea is claimed by claim 11, regarded as a separate claim, except the idea of dismounting the hindmost wheels and bringing them forwards to a position adjacent to and parallel with the foremost wheels... I cannot, therefore, embark upon an enquiry whether the dismountability of the hindmost wheels is an essential or unessential element of the invention claimed, because it seems to me that the patentee himself has told us by the way that he has drawn up claim 11 that this dismountability of the hindmost wheels is the very element of his idea that makes it an invention. When one says, then, as has been said by the majority of the Court of Appeal, that the appellants have "deliberately chosen to make it an essential feature of the claim that the hindmost wheels should be detachable," what one means is not merely that the wording of this claim has been carefully selected, as has all the rest of the patent document, to put the appellants in as strong a position as their expert advisers thought attainable or desirable, but also that the appellants have stated clearly and without equivocation that the point of their invention lies in its application to the hindmost wheels."[43] (emphasis supplied)

This reasoning is interesting as it exposes a mindset in which the patent grant is seen as an exception to be fought for. This is significant in that it necessitates a narrow view of the deserved scope of protection. It is therefore the patentee's duty to clearly define the scope that he desires *from the outset*, and, critically, only very limited latitude is to be given for defects in this drafting process.[44] The effect is to reduce the scope of protection to mere textual infringement. By reading all claim integers as essential, as the patentee "must submit in the first place to be judged by his own action and words," the House of Lords at once sidelines the application of a doctrine that it explicitly endorses. Thus, a paradox is created in that 'pith and marrow' is "from first to last directed to the prevention of abuse of patent rights by colourable evasion". Yet it cannot be invoked where the meaning of the claim is unambiguous, for in this instance the patentee has "committed himself to the unequivocal description of what he claims to have invented". Furthermore, according to Viscount Radcliffe, it is not intended to provide "a special or 'benevolent' method of construing an uncertain claim". Therefore, as Lord Reid states, it is difficult to "see how there could ever be an unessential feature or how this principle could ever operate."[45]

---

[43] *[1963] RPC 61* at 78.

[44] The implausibility of producing perfect claims is considered in Chapter IV, below.

[45] *Ibid.* at 77. Although, it should be noted that Viscount Radcliffe's interpretation was influenced by the fact that the patent had been partially invalidated.

Further illustration of the House of Lords' restrictive attitude to claim interpretation in this period is found in *Rodi & Wienenberger v Showell.*[46] The patent claimed an "extensible chain band, more particularly a wristwatch bracelet made of:" two layers of cylindrical sleeves connected by a pair of "U-shaped" bows. The connecting bows were kept "firmly in the sleeve" by a "spring plate" in "each sleeve". The defendant marketed two similar products, in both the connecting bows in the upper sleeve were joined to form an integral "C-shaped" link, the ends of which functioned as the U-shaped bows in the patented article. In one embodiment ("Excalibur 59") leaf springs were included in each sleeve to prevent the bows from lying loosely, however, they did not function to hold the bows in place to prevent them falling out of the sleeve, as the shape of the bow itself did this. In the other, ("Excalibur 60") the springs were dispensed with entirely, the middle of the connecting bow being shaped so as to provide its own spring.

Three questions came before the House for consideration. First, did the defendant's use of "C-shaped" bows infringe the patentee's "U-shaped" bows? Second, was it essential that the spring plate functioned to keep the bows firmly in the sleeve, so that where the bows were held in place by their shape alone (as in "Excalibur 59") this was not an infringement? Finally, was it essential that a separate bow and leaf spring comprising a bent spring plate be provided in each sleeve, or could the spring plate and the connecting bow be combined?

A majority of the House thought that the defendant's products fell outside of the scope of protection afforded by the patent. Lord Upjohn, adding that:

> "... [T]he question of whether the relevant claim has been infringed ... is purely a question of construction of the claim read as a matter of ordinary language, in the light of the complete specification taken as a whole; but the claim must be construed as a document without having in mind the alleged infringement. What is not claimed is disclaimed. The claim must be read through the eyes of the notional addressee, the man who is going to carry out the invention described."[47]

He continued, stating:

> "... [W]hen the patentee claimed U-shaped connecting bows and then described their insertion and mutual reaction he meant to refer to U-links or bows and not to elongated C-members... As a matter of ordinary construction I think there is only one answer... [the skilled addressee] would think the patentee was describing

[46] *[1969] RPC 367*.

[47] *Ibid.* at 391.

> independent U bows at each end of a transverse sleeve and that was the extent of the claim. I reach that conclusion upon the wording of the claim and without reference to the drawings, though the latter do support that view. That was one of the essential integers claimed in the claim."[48]

Therefore, by virtue of similar reasoning to His Lordship's decision in the Court of Appeal in *Van der Lely*, Lord Upjohn effectively limited the scope of protection to a literal interpretation of the claim. However, more significantly, he also made the following statement of principle to justify this narrow approach:

> "... [I]f the patentee has in his specification limited the essential features of his claim in a manner that may appear to be unnecessary, it may be that the copier can escape infringement by adopting some simple mechanical equivalent so that it cannot be said that every essential integer of the claim has been taken; the Van der Lely case (admittedly a border line case which led to a conflict of judicial opinion upon its facts) affords a very good example. But it must be remembered that unlike a conveyance or commercial document which is normally inter partes and must be interpreted, frequently very broadly, so far as possible to give effect to what appears to have been the intentions of the parties; *a patent is a grant of a monopoly forbidding others to enter a part of the general commercial territory open to all of Her Majesty's subjects and so in the interests of those subjects that territory must be marked out with reasonable clarity by the claim*, construing it fairly in the light of the relevant art."[49] (emphasis supplied)

Therefore, we are provided with an explicit statement of policy. The patent grant is a monopoly, and as such it interferes with the rights of men to operate freely within the general commercial territory. The subtext is therefore that it must be construed narrowly in order to protect society from its abuse. Once more, it is an exception to the sanctity of free trade.

Lord Reid, again offering dissenting judgment, was of the opinion that the claims should be viewed with an eye to the intended recipient; the skilled addressee. Therefore,

> "... [The] claims are not addressed to conveyancers: they are addressed to practical men skilled in the prior art, and I do not think that they ought to be construed with that meticulousness which was once thought appropriate for conveyancing documents."[50]

Individual phrases should be read in the context of the claim as a whole, interpreted in the light of the specification. As such, the interpretation that is placed on them should take account of their function. Lord Pearce, also dissenting, added that:

---

[48] *Ibid.* at 393-4.

[49] *Ibid.* at 391-2

[50] *Ibid.* at 378.

> "Had the claim been a direction to a printer or a type-setter, the alphabetical approach would seem to me correct, since the alphabet would clearly be relevant and the identity and formation of a particular letter would probably be the essential ingredient of the integer described. But the essence of the connector to anybody thinking on mechanical rather than literary lines would be a bridge connecting two parallel limbs which would lie in adjacent sleeves. That quality would be fulfilled whether one described it as U-shaped bows, or J-shaped links, or goal posts.
>
> If one discards alphabetical niceties, there remains the more solid argument that here, instead of the two U-shaped bows, one has running all through the sleeve one continuous integer albeit having at each end (at the relevant point of interconnection) a link which performs the same function as a U-shaped link in that it acts as a bridge to join the adjacent sleeves and in that its limbs perform the pivotal action against the leaf springs.
>
> It is important that in construing a patent one should seek to find what it means to the reasonable person who is reasonably versed in the matters of which it speaks – in this case mechanical. It is directed to the workshop and the market place rather than to the cloister. For that reason a plain straightforward construction is generally to be preferred to one that is strained or literary or tortuous. And meticulous niceties of construction which are wholly appropriate to a legal document may seem to the practical man to have a flavour of pedantry if they so whittle away a patent that they enable a copyist to avoid its ambit by means that seem to be concerned with words rather than essentials."[51]

Therefore, there is clear difference of opinion concerning the canons of construction that are to be applied in any given case. The majority judgment suggests that the patentee's choice of the phrase "U-shaped" automatically limits the claim to this, and no other, shape of bow. This approach is significant, as it prompts the view that in order to provide adequate protection scope the patentee should refrain from adding restrictions to their claims. Their Lordships state that the reason for their narrow approach is that it is in the interests of society that the patent marks out its territory with reasonable clarity by the claim. Yet, the result of their narrow interpretation is that the patentee is encouraged to introduce uncertainties in the hope of broadening their protection.

Lord Upjohn's statement that the "patent is a grant of a *monopoly* forbidding others to enter a part of the general commercial territory open to all of Her Majesty's subjects", is telling as it exposes a mindset (perhaps even prejudice) that has its origins in the abuses of Crown grants under Elizabeth I.[52] In addition, by focussing on the rights of society, rather than the rights of the patentee, the House may be criticised as loosing sight of the real reason that we have patent protection at all. As Cole notes, there is a distinction that exists "between the primary purpose of the Patents Acts and their secondary purposes." The primary purpose is the "encouragement of manufacturing industry

[51] *Ibid.* at 387-8

within the UK by granting to inventors a limited monopoly in their inventions." The fact that the patentee is asked to define the scope of their invention in claims is "a secondary object of the Act intended to allow the system to operate smoothly". Where there is conflict between the two, the primary purpose should prevail.[53]

The purpose of this thesis is to examine the validity of these statements. In order to do this we first look to the history of the patent system, and consider the origins of the 'anti-patent' attitude in which the grant is seen as an exception to the general prohibition of monopoly.

---

[52] Discussed in Chapter II, below.

[53] See Cole, *Patent Infringement – 'Pith and Marrow' – A Review of United Kingdom Practice*, [1980] EIPR 289 at 298.

CHAPTER II

History of the Patent System

–

The Canvas Prepared

Introduction

The exact origin of modern patent law is unknown. Legal academics and historians vie to produce the definitive point of conception of the system, citing in turn the Greeks[1], the Byzantines[2], the Italians[3] and the English[4], amongst others, as having sown the first seeds. It is impossible to tell which, if any, of these assertions is correct. What is clear, however, is that the development of the patent model was by no means peculiar to England, despite the occasional assertion to the contrary.[5]

The notion that there may be some kind of property in the fruits of intellectual labour dates back to at least the time of Ancient Greece. However, it is apparent that any such concepts, and attendant rights, were usually perceived in terms of the physical object or teaching of the trade so protected.[6] Indeed, it is not until the end of the 18th century that we begin to see widespread acceptance of the notion of property in the intangible *per se*.[7] Furthermore, the roles of the patent system, and therefore the justifications that can be used to rationalise its existence, have changed dramatically over time. We turn to consider these issues more fully in Chapter III, for now it is sufficient to note that these early customs bear little resemblance to the system of grants with which we are faced in the modern commercial sphere.

---

[1] See for example Merges, *Intellectual Property in the New Technological Age*, (1997; Aspen Law & Business, New York) at 121.

[2] Frumkin, *Early History of Patents for Invention*, (1947) 26 Trans. Newcomen Soc. 47 (hereinafter Frumkin, *Early History*).

[3] Prager, *A History of Intellectual Property 1545 to 1787*, (1944) 26 JPOS 711 (hereinafter Pager, *History*).

[4] Price, *The English Patents of Monopoly* (1913; Oxford University Press, Oxford) (hereinafter Price).

[5] See for example Fox, *Monopolies and Patents: A Study of the History and Future of the Patent Monopoly*, (1947; University of Toronto Press, Toronto), at 85; Price, *ibid.* at 7; and Hindmarch, *A Treatise on the Law Relative to Patent Privileges for the Sole use of Inventions* (1846; Stevens, Norton & Benning, London) at 3.

[6] Long, *Invention, Authorship, "Intellectual Property," and the Origin of Patents: Notes toward a Conceptual History*, (1991) 32 Technology & Culture 846, at 858.

[7] Walterscheid, *The Early Evolution of the United States Patent Law: Antecedents (Part I)*, (1994) 76 JPTOS 697 (hereinafter Walterscheid, *Antecedents I*) at 702-3. See also Bently & Sherman *The Making of Modern Intellectual Property Law*, (1999; Cambridge University Press, Cambridge), *passim*.

The Guild System: Alternative Monopoly

During the Middle Ages, the guild system was the prevalent form of monopoly extant in Europe.[8] A guild was a group of craftsmen or merchants, defined by their trade and skills, which exercised control over their respective mystery by the use of monopoly. They fixed the price and quality of goods and services and provided for the security of their members. These monopolies were essentially of municipal and local character. If a tradesman wished to practise his art then he would have to join the relevant guild or else face rampant opposition from its members.

The guilds obtained by Charter the right of exclusive sale within the town of the goods made by them.[9] Moreover, they were also granted the sole right of supervising and regulating their trade within the area in which they operated. The right of market or fair granted by Royal charter, or acquired by custom, served in many cases to constitute the only exceptions to the guilds' control.[10] However, the privileges enjoyed by these bodies were not individual rights, they were group monopolies within which there was free competition. The privileges of the guild were confined to protection from the competition of strangers, the regulation of the trade and the maintenance of price. Their monopoly was not a restriction upon competition *per se* but merely upon the number of competitors.

Early Monopoly Grants

Outside of the guilds there is little evidence to support any claim that there was a system of monopoly grants that can be likened to a patent system until the Statute of Venice, promulgated in 1474. Such grants as can be found are sporadic and disorganised, however a number of claims deserve mention.

---

[8] The importance of the merchants' guild, to which, as a general rule, all of the town's traders were obliged to belong, has been chronicled by many. In particular Stubbs, *The Constitutional History of England in its origin and development*, (1880; Clarendon Press, Oxford; Library Ed.) Vol. I, states that "in the reign of Henry II there can be little doubt that the ... merchant guild ... was in fact, if not in theory, the governing body of the town in which it was allowed to exist." at 453. Quoted from Fox, *op cit.* at 33. For an informative discussion of the Guild system in England see Fox, *op cit.* at 30-41 and Price, *op cit.* at 6-7.

[9] Brentano, *On the History and Development of Gilds, and the Origin of Trade-Unions*, (1870; Trübner, London) at xciii; See also, Fox, *op cit.* at 32.

[10] Maitland, *Domesday Book and Beyond: Three Essays in the Early History of England*, (1897; Cambridge University Press, Cambridge) at 193-4; See also, Fox, *op cit.* at 32.

Frumkin's assertion that such a system was evident in the semi-Byzantine kingdom of Jerusalem in the 12th century,[11] relies solely on the writings of a traveller, Benjamin of Tuleda, who mentions an exclusive privilege for the dyeing of cloth to found his claim. The authority of this account is dubious considering the unofficial nature and singularity of his source, but Frumkin also mentions other early instances of grants including a fifteen-year monopoly for the manufacture of cloth in Bordeaux in 1236. However none can be said to show evidence of anything other than singular instances in which privilege was conferred.

Kaufer refers his readers to a number of early mining patents[12] and Pohlmann states that there are examples of 'proto-patents', as he terms them, in the German principalities as early as 1378 but asserts that Germany's first patent of monopoly privilege was granted in 1484 as part of a system that flourished until the thirty years war.[13]

The Statute of Venice

Historians generally accept that Italy provided the backdrop for the genesis of a modern *policy* of monopoly grants - although there is a small bone of contention as to whether it was the city-state of Venice or that of Florence that can lay claim to the title of creator.[14] Whichever, if either, is responsible for the idea it was Venice that first marshalled its custom into statutory form when, in 1474, it enacted what has come to be known as 'The Statute of Venice.' It reads:

> "We have among us men of great genius, apt to invent and discover ingenious devices; and in view of the grandeur and virtue of our city, more such men come to us every day from divers parts. Now, if provision were made for the works and devices discovered by such persons, so that others who may see them could not build them and take the inventor's honour away, more men would then apply their genius, would

---

[11] Frumkin, *Early History, op cit*

[12] Kaufer, *The Economics of the Patent System*, in Lesourne & Sonneschein (eds), *Fundamentals of Pure and Applied Economics* (series), (1989; Harwood, New York) at 2.

[13] Pohlmann, *The Inventor's Right in Early German Law, (1961) 43 JPOS 121*. See also Greenstreet, *History of Patents* in Liebesny (ed.), *Mainly on patents. The Use of Industrial Property and its Literature* (1972; Butterworths, London) at 5.

[14] Most academics conclude Venice, but Bugbee, *The Genesis of American Patent and Copyright Law*, (1967; Public Affairs Press, Washington D.C.) asserts Florence's claim to the title, at 17.

discover, and would build devices of great utility and benefit to our commonwealth. Therefore:

> BE IT ENACTED that, by the authority of this Council, every person who shall build any new and ingenious device in this City, not previously made in our Commonwealth, shall give notice of it to the office of our General Welfare Board when it has been reduced to perfection so that it can be used and operated. It being forbidden to every other person in any of our territories and towns to make any further device conforming with and similar to said one, without the consent and licence of the author, for the term of ten years. And if anybody builds it in violation hereof, the aforesaid author and inventor shall be entitled to have him summoned before and magistrate the said infringer shall be constrained to pay him [one] hundred ducats; and the device shall be destroyed at once. It being, however, within the power and discretion of the Government, in its activities, to take and use any such device and instrument, with this condition however that no one but the author shall operate it."[15]

The Venetian Statute contained all of the essential features of a modern patent law. It provided that the devices must be novel (new and ingenious),[16] that they must be reduced to perfection and not previously made in the Commonwealth. It gave a term of protection (10 years), provided for the licensing of the invention and set out a procedure for determining infringement and in addition provided a remedy. Furthermore, it reserved the right of the State to take and use the invention for itself, a condition mirrored in the Crown use provision of the current United Kingdom Patents Act.[17] In all aspects it evidences a modern approach to patents.

The success of this Statute in stimulating invention is difficult to gauge, however, it is evident that it was a profound success in terms of the number of State grants of protection. In the 75 years before the enactment of the statute some 10 or 11 patent grants are evidenced in Venetian reports,[18] compared to over 100 in the next 75.[19]

---

[15] Quoted from a translation in Mandich, *Venetian Patents*, *(1948) 30 JPOS 166* (hereinafter Mandich, *Venetian Patents*) at 176-7.

[16] Prager, *The Early Growth and Influence of Intellectual Property*, *(1952) 34 JPOS 106* (hereinafter Prager, *Growth*) at 139 and Mandich, *Venetian Patents*, *ibid.* suggest that the use of the term requires a level of inventive merit above an obvious application of known technology; Prager goes as far as to say that this phrase suggests a requirement of considerable inventive merit. Walterscheid *Antecedents I*, *op cit.*, at 709 disagrees, saying that this seems to be an attempt to apply modern sensibilities concerning obviousness to a law more than half a century old. He states that it is questionable whether the concept of obviousness was understood in the Venice of the 15th century.

[17] s.55-s.58 Patents Act 1977.

[18] Prager, *Growth*, *op cit.* Also Mandich, *Venetian Origins of Inventors' Rights*, *(1960) 42 JPOS 378* (hereinafter Mandich, *Inventors' Rights*).

[19] Mandich, *Inventors' Rights*, *ibid.*

The Spread of a Statute

With the discovery of sea routes around the Cape of Good Hope at the end of the 15th century, which relaxed the Venetian grasp upon the highly lucrative trade routes between Europe and the rest of the world, it was inevitable that the success and prosperity that the Republic had enjoyed for so long must soon come to an end. This it did, and with it came an exodus of craftsmen and artisans who took with them the knowledge of the Venetian patent custom.[20]

Knowledge from the Statue spread across Europe and found fertile ground.[21] France has been described as an "obvious recipient" as the first French patent was granted in 1551 to an Italian from Bologna for "glassware according to the manufacture of Venice."[22] Price,[23] often obtuse in his reasoning, agrees that by the end of the 16th century a systematic use of patents had developed in France but argues, albeit unconvincingly, that this may well have been in imitation of the already well developed English custom.[24] The Germanic States also apparently benefited from the teachings of the Venetian craftsmen and granted their first patents from approximately 1484,[25] a practice that crystallised into a tradition that was to last until the 'Thirty Years' war. It appears that the Netherlands was also influenced in this manner and established a

---

[20] Greenstreet, *op cit.* at p.4 states that there is a strong suggestion inferred from records of early grants in other countries that the idea of patent systems spread throughout Europe from Italy with emigrating glass workers. MacLeod, *Accident or Design? George Ravenscroft's Patent and the Invention of Lead Crystal Glass, (1987) 28 Tech & Culture 776* at 780-1, states that the patent custom was 'carried out' of Venice by glassmakers seeking to obtain the same degree of protection from local competition that they had enjoyed in the Venetian Republic.

[21] MacLeod, *Inventing the Industrial Revolution: The English Patent System 1660 - 1800*, (hereinafter MacLeod, *Industrial Revolution*) (1988; Cambridge University Press, Cambridge) at 11 comments that "[i]t is no coincidence that the first recorded patents in many countries at this time were for glass making, a skill in which the Venetians excelled." Also Mandich, *Inventors' Rights, op cit. passim.*

[22] Mandich, *Venetian Patents, op cit.* at 206; and Prager, *History, op cit.* at 723.

[23] Price, *op cit.* at 5.

[24] Price adduces no evidence to back this up, therefore it should be considered at least speculative. See Walterscheid *Antecedents* I, *op cit.* at 711-3 for a brief discussion of the early French patent custom.

[25] See Walterscheid, *Antecedents I, op cit.* at 711; Greenstreet, *op cit.* at 5; and Pohlmann *op cit.*

patent custom in the middle of the 16th century. The Italian connection is, again, evident.[26]

Early English Grants

In England, the earliest recorded example[27] of a patent grant is that to John Kempe of Flanders and his servants, apprentices, and other members of the Weavers' Mystery, and the fullers and dyers who might wish to come to England; of "franchises as many and as much as may suffice them."[28] Frumkin[29] describes this as provision by Edward III of a non-exclusive privilege for exporting woollen cloth. However, both Hulme[30] and Fox[31] make it clear that, far from being an export privilege, this grant had as its object the instruction of the English in a new industry and further, according to Hulme,[32] was in line with an ordinance of 1326 designed to promote the textile industry. The importance of this grant is not in the offer of protection *per se*, but rather in the fact that it contained a general promise to extend similar privilege to all foreign weavers. In short, therefore, it was an overt declaration of a policy for the encouragement of English industry through Crown protection.

The incentives offered by the Crown in the 14th and 15th centuries were diverse and not necessarily restricted to sovereign protection.[33] Indeed, they could be anything from financial benefits and favourable tax treatments, to the grant of franchises and

---

[26] See Walterscheid *Antecedents I, op cit.*, at 714; see also Doorman, *Patents for Inventions in the Netherlands During the 16th, 17th and 18th Centuries*, (1942; Nijhoff, The Hague) at 14-15; and Greenstreet, *op cit.* at 4.

[27] That has been discovered and interpreted as such.

[28] Pat 5 Edw. III 1 m. 25; Cal. Rot. Edw. III (1330-4)

[29] Frumkin, *Early History*, *op cit.* at 48.

[30] See Hulme, *The History of the Patent System under the Prerogative and at Common Law*, *(1896) 12 LQR 141* (hereinafter Hulme, *Prerogative*).

[31] Fox *op cit.* at 43.

[32] Hulme, *The Early History of the English Patent System*, in Volume III of *Select Essays in Anglo-American Legal History* (1909; Little, Brown & Company, Boston) 117 (hereinafter Hulme, AALH), at 119. This work is a revised and condensed version of Hulme's four articles published in the LQR between 1896 and 1902.

[33] Although in England this was crucially important when dealing with the importation of an industry by foreign artisans, as they could not claim the protection and rights of the common law. Also foreigners tended to be quite unpopular with the indigenous population, Crown protection often being critical to protect them and their property from mob violence. See Holdsworth, *A History of English Law* (1932; Methuen, London, 5th Ed) (hereinafter Holdsworth, *English Law*) Volume IV, at 335.

exemption from the rigours of certain statutes.[34] However, the common thread that flowed through all was the desire of the to promote native *manufacture* through the importation of foreign knowledge, regardless of how it was obtained. This patent custom, if it may be called such at this point, was evidently concerned with fostering English industry and self-sufficiency by offering incentive to immigrate, in the hope of rectifying the country's technological lag compared to the rest of Continental Europe.[35]

Thus, we see a grant in 1336 to two Brabant weavers to settle in York in consideration of the value of industry to the Realm[36]; an invitation in 1368 to three clockmakers of Delft to come to England for a short period[37]; letters patent dated 1440 to John of Schiedame for a process of making salt on a scale never before attempted in the Realm[38]; and a grant in 1452 to the Bohemian miners, based upon their possession of scientific methods in mining.[39] All of which were designed to improve the knowledge of the Realm and do not purport to protect the manufactures as inventions in themselves.

As the conditions for life became more stable and the populace more tolerant of the international character of these artisans, the need for protection gradually disappeared and the necessity for adequate reward took its place.[40] Thus, slowly, these inducements evolved into limited exclusive rights in areas of industry controlled by the State, hence pointing the way to the birth of a true monopoly right.[41]

---

[34] For a discussion of such early incentives see, for example; Prager, *History*, *op cit.* at 714-5; and *Growth*, *op cit.* at 118-26; Mandich, *Venetian Patents*, *op cit.* at 171; Holdsworth, *English Law*, *ibid.* Volume IV, at 344-5.

[35] Hulme, *Prerogative*, *op cit.* for example, states that " ... English society [at the time] was mainly that of a pastoral and mining community, exchanging undressed cloth, wool, hides, tin and lead for the manufactures of the continent and the produce of the East." *Idem.* at 142. See also, Holdsworth, *English Law*, *op cit.* Volume IV, at 341, 344-6; MacLeod, *Industrial Revolution*, *op cit.* at 10; and Fox, *op cit.* at 43-7.

[36] 10 Edw. III, Dec. 12.

[37] 42 Edw. III, p. I

[38] 18 Hen. VI, Franc. 18. m. 27.

[39] See Hulme, *Prerogative*, *op cit.* at 143 who asserts that this is "[t]he first example of a grant made to the introducer of a newly-invented process ... ". Also Fox *op cit.* at 44.

[40] Fox *op cit.* at 45.

[41] Walterscheid *Antecedents I*, *op cit.* at 707.

It is unclear when the first English monopoly patent of invention issued to individuals was in fact granted. The argument seems to lie between those backing 1561[42] and those who consider 1552 to be the year in which the first issuance occurred.[43] A small number of academics claim the correct date to be 1449,[44] but as one commentator states, "John of Utynam's patent of 1449 stands solitary, detached, and inscrutable."[45] Whatever the date of the first patent of invention, it is clear that the system took root and flourished during the reign of Elizabeth I, for in the years between 1561 and 1600 in excess of 50 patents were granted.[46]

The shift from the sporadic and essentially *ad hoc* pre-Elizabethan grants is, once more, presaged by the Italian factor. Commentators note a letter sent in 1537 to the King's Principal Secretary, Thomas Cromwell, by a Venetian, one Antonio Guidotti, proposing to bring Italian silk weavers to England in return for 15 to 20 years' control of the production of silk in the Realm.[47] There is no evidence that Guidotti actually received a grant, however, the letter provides proof that Venetian practice was at least known in the Kingdom.

---

[42] Including Hulme, *Prerogative*, *op cit.* at 145; Holdsworth, *English Law*, *op cit.* Volume IV, at 345; Hauhart, *The Origin and Development of the British and American Patent and Copyright Laws*, *(1983) 8 Whittier Law Review 539* at 541; and Bugbee, *op cit.* at 174.

[43] See, for example, Davies, *Further Light on the Case of Monopolies*, *(1932) 48 LQR 394* (hereinafter Davies, *Further Light*) at 396, a point he reiterates in *The Early History of the Patent Specification*, *(1934) 50 LQR 86* (hereinafter Davies, *Early History*) at 95; Klitzke, *Historical Background of the English Patent Law*, *(1959) 41 JPOS 615* at 629; Fox, *op cit.* at 60-1; and MacLeod, *Industrial Revolution*, *op cit.* at 11.

[44] See Greenstreet, *op cit.* at 1, 5-6; also Gomme, *Patents of Invention: Origin and Growth of the Patent System in Britain* (1946; Longmans, Green and Co., London) at 6-12. This number also includes the patent office, see http://www.patent.org.uk. The patent is discussed at length in Thorne, *John Utynam's Patent A.D. 1449 and Medieval Common Law and Other Considerations of Related Interest*, *(1957) 27 Canadian Pat Rep 21*.

[45] Gomme, *op cit.* at 13. Also Klitzke, *op cit.* at 630.

[46] Again there are disagreements between academics as to the correct number; Hulme, *The History of the Patent System under the Prerogative and at Common Law – A Sequel*, *(1900) 16 LQR 44* (hereinafter Hulme, *Sequel*) at 52 states the number to be 51; Klitzke, *op cit.* at 635 cites Hulme for the proposition that 55 grants were made in this period; Fox, *op cit.* at one point states that 55 grants were made (page 50), but later asserts that the number was fifty-one (pages 61-2); whilst Federico, *Origin and Early History of Patents*, *(1929) 11 JPOS 292* at 297, indicates that Elizabeth granted 20 patents in the first 10 years of her reign, and 40 thereafter.

[47] See, for example, MacLeod, *Industrial Revolution*, *op cit.* at 11; Klitzke, *op cit.* at 629; Gomme, *op cit.* at 8-9; and Greenstreet, *op cit.*, at 5-6.

A New Policy of Monopoly Grant

The early years of the reign of Queen Elizabeth I are marked by conscious acceleration in the policy of stimulation of domestic industry in order that the 'technologically backward' State might become self-sufficient.[48] Central to this was the acquisition of superior technology, particularly in those areas that had previously "figured most prominently on the list of imports – viz. alum, glass, soap, oils, salt, saltpetre, latten, etc."[49] It is to this end that we see patents issued by William Cecil (Lord Burghley), Elizabeth's first minister.[50]

The policy cultivated by Burghley made the provision of monopoly a natural phenomenon. It broke away from the fetters of local custom and allowed for the diversification and expansion of industry.[51] The system still aimed at the importation of knowledge and skill from abroad and still sought to encourage the institution of new manufacture. However, the grant of exclusive privilege was becoming accepted as a cheap and effective method of improving the technological climate of the Realm, a policy argument that is comfortably familiar to any student of the patent system today. The only difference between the concept of the custom then and now[52] being that, as yet, it was a matter of unquestionable prerogative power. However, events of the next few years changed the way that society was to view these grants, and indeed the Crown, perhaps forever.

Novelty and Consideration

Close interest was paid to ensuring novelty of the invention during the early years of Elizabeth's reign, a fact that emphasises that technological *improvement* of the Realm was a driving force behind the creation of the policy. The Crown was therefore careful to consider the merits of petitions for new inventions and to avoid displacing established industries. Employment of a native workforce was considered sacrosanct, and efforts were made to avoid impinging upon their livelihoods. Thus the Chiddingford

---

[48] See Walterscheid, *The Early Evolution of the United States Patent Law: Antecedents (Part 2)*, *(1994) 76 JPTOS 849* (hereinafter Walterscheid, *Antecedents II*) at 855 and Getz, *History of the Patentee's Obligations in Great Britain*, *(1964) 46 JPOS 62* continued at *214* at 69-71.

[49] Hulme, *Prerogative*, *op cit.* at 152; also MacLeod, *Industrial Revolution*, *op cit.* at 12.

[50] See Walterscheid, *Antecedents II*, *op cit.* at 855; and MacLeod, *Industrial Revolution*, *op cit.* at 11.

[51] See Price, *op cit.* at 6.

[52] Procedure and subject matter aside.

glassmakers were consulted to see if they could make Normandy window glass before a patent for its production was issued to a group of foreign artisans.[53] Similarly a grant for the production of salt was refused in 1589 due to the fact that many native workers were using similar techniques. The patenting of mere improvements to existing inventions was also prohibited for the same reasons.

Clear and distinct expectations were developed, which, although the specifics varied from grant to grant, were "nonetheless consonant with the basic premise of developing new trade and industry within the Realm."[54] In modern patent grants this role – the consideration that the patentee must provide in return for the protection offered – is satisfied by the provision of the specification, filed for public reference at the granting Patent Office. However, it was not until the 18th century that such a requirement was made of the patentee.[55] In Elizabethan times consideration was acquired by the provision of requirements intended to ensure, not only the introduction and operation of the new art, trade or industry, but also, and more importantly, its establishment within the Realm.

The 'Working' Clause

Patentees would often voluntarily bind themselves to put the invention into practice by words used in the petition and in the recitals of the patent. It was a well-known axiom of English law, relating to all forms of Royal grant, that the "King must not be deceived in his grant", the penalty for the contravention of this rule being the annulment of the grant.[56] Englishmen were considered to know and respect this imperative, but foreigners were "apt to plead ignorance of the English common law!"[57] and could therefore not be trusted. Thus, clauses were often,[58] but not always,[59] worked into the grants themselves in furtherance of this aim. The most basic of such clauses inserted

---

[53] See MacLeod, *Industrial Revolution*, *op cit.* at 12.

[54] Walterscheid, *Antecedents II*, *op cit.* 856-7.

[55] See the text accompanying footnote 171 *et seq.* below

[56] For a number of authorities that state this rule see Davies, *Early History*, *op cit.* at 100.

[57] Walterscheid, *Antecedents II*, *op cit.* at 857.

[58] See Hulme, *On the Consideration of the Patent Grant, Past and Present*, *(1897) 13 LQR 313* (hereinafter Hulme, *Consideration*) at 314.

into grants of this period were those which required the patentee to 'work' the new art, trade or industry within the kingdom;[60] frequently time limits would be placed upon such 'working', the grant being void for lack of consideration if they were not adhered to. Also prevalent at the time were clauses obligating the patentee to employ and train native artisans to practice the trade covered by the grant. Walterscheid explains that this type of requirement was usually only applied to foreign patentees in order to safeguard the continuance of the industry should the patentee abscond before the term of his patent expired:[61] therefore accomplishing the same result as the 'working' requirement.[62] Variations on this theme included limitations on the number of aliens that the patentee might employ. In addition, clauses were sometimes introduced that required the patentee to prove the novelty or efficacy of their invention within the specified period. Evidence has been adduced to suggest that it was customary to bind foreign artisans in this way.[63] Further, the Crown often imposed requirements of a minimum standard of quality and an obligation that the price be less than if the goods were imported in consideration of the grant.

The Revocation Clause

As time went on, and the policy became more established, the 'working' clause was gradually phased out in favour of a general revocation clause. This allowed the Crown to revoke grants on grounds of their being "generally inconvenient", a simple but all encompassing concept easily applicable to a failure to introduce the patented industry within the specified time period.[64] Davies declares its first use as being in a grant of 1575 to Holmes and Frampton for African headwear.[65]

The revocation clause rose out of the fact that the grant of a patent was a matter of Royal grace, and thus the hand that gave could also take away. Despite the potential

---

[59] See Davies, *Early History*, *op cit.* at 101-2 for a discussion of several grants not containing such clauses but which were accompanied by complimentary indentures between the Crown and the patentee whereby such requirements were inserted.

[60] As opposed to merely introducing it.

[61] Walterscheid, *Antecedents II*, *op cit.* at 857.

[62] An example of the use of this type of covenant can be found in the patent of Burchart Cranyce who undertook to teach "the secrets of his arte" to Englishmen. See Walterscheid, *ibid.*

[63] Davies, *Early History*, *op cit.* at 102.

[64] *Ibid.* Also Walterscheid, *Antecedents II*, *op cit.* at 857.

breadth of the clause, it was mostly exercised in cases of non use, cases where the grant was made on a false suggestion of novelty, and where the true inventor was discovered to be other than the patentee.[66] It can be found in patents granted for the next two hundred years.

The main object of the patent custom at this time was clearly the institution of new manufacture. Its object was the technological improvement of the Realm, and the most simple and effective method of doing this was the importation of knowledge from abroad. In short, the patent system protected and stimulated *innovation* directly, and invention (in the modern sense of the word) only indirectly if at all.

The Problem of 'Odious Monopolies'

In addition to the legitimate and unobjectionable grants discussed above, the Elizabethan policy of monopoly reward carried with it a more shady countenance, which arose out of subtle but significant departures from earlier practice.

Elizabeth's policy marked a departure from earlier mediaeval patents in two important ways. First, as stated above, early grants usually took the form of offers of Crown protection and not of monopoly privilege, although as noted there were a small number of exceptions. Second, the 'new' system of monopoly grant relied far more heavily on the representations of the patentee than did the old. This reliance caused a gradual, but inexorable, devolution of responsibility for the introduction of new industry from the Crown to the patentee.[67]

Under the old system, where the Crown had been the administrator of the privilege, the grantee was essentially under Crown control. With the new system, however, it no longer had this direct influence; the power to act under the grant was transferred to the patentee who wielded and abused it as they pleased. Yet the jurisdiction for the settlement of grievances remained with the Crown. Holdsworth accurately sums up the position when he states that; "those who suffered [at the hands of monopoly grants]

---

[65] Davies, *Early History*, *op cit.* at 102.

[66] *Ibid.* at 103-4.

[67] See Inlow *The Patent Grant*, (1950; Johns Hopkins University Press, Baltimore) at 20; Holdsworth, *English Law*, *op cit.* Volume IV, at 347 and Hulme, *Prerogative*, *op cit.* at 151.

naturally wished for a better remedy than an appeal to the authority from which they emanated."[68]

It was inevitable that this transfer of power and responsibility should lead to abuse, and grievances crept into the system early in its life. The Queen was quick to realise that the granting of monopolies could be used to reward favourites without depleting the Royal coffers. Courtiers saw that the policy could be exploited for their own personal gain, the mere existence of a system of exclusive privileges being sufficient incentive to join in the race for favours.[69] Drawn by licensing patents or lucrative new monopolies in old industries, they left the more uncertain reward of patents for new inventions to the "poor and often chimerical inventors"[70]. Thus we see patents for the production of salt,[71] vinegar[72] and starch[73], all established industries, being granted to court favourites. At "the hands of the corrupt courtiers the system of monopolies, designed originally to foster new arts, became degraded into a system of plunder."[74]

Monopoly Classified

The contemporary definition of "inventor" and "invention", combined with a lack of specifications, makes it impossible to clearly divide the grants of this era into those that are novel and useful by modern standards, and those that would be considered abuses.[75] However, Lipson, in his *Economic History of England*, suggested the sub-division of patents into four categories, which attracted varying degrees of objection at the time of

---

[68] Holdsworth, *English Law*, *op cit.* Volume IV, at 347. See also Hulme, *ibid.* who states that; "to dispute the Queen's licences before the Privy Council or in the Court of Star Chamber or in the Exchequer constituted a risk which few individuals cared to run, as the Courts were apt to regard non-compliance with the requirements of the patentee as evincing a want of respect for the Queen's authority."

[69] See Price, *op cit.* at 16-17.

[70] *Ibid.*

[71] Pat 27 Eliz. pt. 6. of September 1, 1585 to Thomas Wilkes.

[72] Pat 26 Eliz. pt. 11. of March 23, 1584 to Richard Drake.

[73] Pat 30 Eliz. pt. 9. of April 15, 1588 to Young.

[74] Price, *op cit.* at 16-17.

[75] See Fox, *op cit.* at 62. For a list of Elizabethan grants see Hulme, AALH, *op cit.* at 121-38; Also *Prerogative*, *op cit.*; and *Sequel*, *op cit.*

Elizabeth.[76] His approach provides an exhaustive method of classification,[77] and can be summarised as follows:

First, there are patents to which no exception could be taken. These are grants that that provided protection for new industries, whether for inventions in the modern sense of the word or technological know-how imported from abroad.

At the opposite end of the spectrum were those grants that gave control of an established trade to an individual or group. These constituted a major grievance as they took from the people the right to enjoy a liberty previously open to them. In addition they were often bad for want of consideration moving to the public.

However, it is clear that these first two categories are not necessarily mutually exclusive as the second may eventually result from the first. Thus, the soap monopoly of Groyett and Le Leuryer "to make white sope" as good and as fine as any in the "Sope house of Triana or Syvile",[78] which was unobjectionable when first granted in 1561, was relegated to the second category by a series of additional grants issued long after the trade had lost its novelty. So too with the monopoly for the production of Starch, originally awarded to Young in 1588 and continued by grants to various others well into the mid 1660's.[79]

Lipson's third category, also disagreeable in nature, concerned grants conveying powers of supervision over an established industry or trade.

Finally, of intrinsically less objectionable character, but under which grave abuses nevertheless flourished, were those patents taking the form of licences relaxing the austerity of the law in areas of import, export and the transport of certain commodities. These grants arose because it was often more expedient to grant limited licences to evade an unworkable law than to repeal the statute as a whole.

---

[76] (Volume III) (1929; Messrs. Black Ltd., London) at 352-6. See also Davies, *Further Light*, *op cit.* at 397 and Fox, *op cit.* at 62-5 from which the basis of the summary has been drawn.

[77] Davies, *Ibid.* at 398.

[78] Which Fox, *op cit.* at 61; states may be said "to have launched the policy of encouraging new manufactures so vigorously pursued by Elizabeth and Burghley."

[79] Fox, *op cit.* at 64.

However, it was not simply the grant of patents in these objectionable areas that caused problems; instrumental in the creation of these so-called 'odious monopolies' were the powers of policing that accompanied the grant. The patentee was often provided with full powers of supervision, search, seizure and arrest of infringers in addition to ability to recover fines or penalties for infringement.[80] Needless to say, this was an open invitation to abuse.

Mounting Opposition

That the matter of abuses escaped serious opposition for most of Elizabeth's reign is partly due to the (overall) cautious manner in which policy was conducted, but also to the popularity of the Queen. The issue of odious monopolies was first raised in Parliament in the 1571 session but was the subject of stern rebuke by the Queen as an attack on the Royal prerogative. This sharp and damning attack on those who wished to trim her "chiefest Flower" was effective in silencing her opponents for the next 25 years until, in 1597, the issue of odious monopolies once again reared its head, prompted by the pressures of industrial depression.

Elizabeth was firm in her stance, and once more condemned those who attacked her. However, seemingly aware that the problem would not just fade away she also promised to "examine all patents and to abide the touchstone of the law,"[81] but this time her delaying tactics were not so effective.

On 20th November, 1601, a Bill was introduced to Parliament entitled "An Act for the Explanation of the Common Law in Certain Cases of Letters Patent". It prompted four days of debate, to which the Queen herself put an end by the issuance of a statement through the Speaker. Thus, Elizabeth said, "she understood that divers patents, that she had granted, were grievous to her subjects",[82] but that she had never assented to grant anything *malum in se*.[83] Furthermore, she doubted the wisdom of simply repealing undesirable grants, stating that if the Bill were withdrawn she would agree to submit her patents to trial according to the law.

---

[80] Walterscheid, *Antecedents II*, *op cit.* at 864.

[81] 1 Parl Hist 906; quoted from Fox, *op cit.* at 75.

[82] See Fox, *op cit.* at 77.

This concession was most significant as it shifted any blame for the abuses away from the prerogative and onto the patentee. Moreover, as the courts' discussion of the monopolies in question would inevitably turn on the facts of the individual cases, an in depth criticism of the policy of monopoly grant and the role and nature of the prerogative was deftly avoided.[84]

The picture to emerge from the continued abuse of monopoly grants is one of increasing hostility and distrust of the monopoly as a barrier to free trade. The monopoly system, designed to foster technological improvement within the Realm, to make the Kingdom self-sufficient, was being defiled. The minds of the people, of Parliament, and of the courts of the common law were therefore turned against the system. The only thing that prevented an overt attack on the prerogative power was deft manipulation of the situation by a powerful and, most importantly, popular Queen.

The problem of odious monopoly hangs like a fog shrouding the brilliance of the innovation that such a policy of monopoly grants in fact represents. The main object of the policy, the technological improvement of the Realm, was, after all, a resounding success. There is no evidence that Elizabeth set out to grant monopolies harmful to the State. Even where patents were issued in restraint of trade it is clear that the necessity for supply was considered greater than the inconvenience caused. Thus, maintenance of supplies of gunpowder and ordnance of sufficient quality and quantity for the needs of the Realm was considered to outweigh the social cost of imposing a monopoly in its production. Indeed, when Elizabeth came to the throne there was a frightening need for ordnance;[85] by 1591 English cannon were considered to be the best in Europe, and even the Spanish attempted to buy them.[86] In short, it was "not the monopolies which were bad, but only their abuse".[87]

---

[83] Wrong in itself

[84] See Holdsworth, *English Law*, *op cit.* Volume IV, at 348-9; and Fox, *op cit.* at 78-9 for further discussion.

[85] State Papers, Domestic. Eliz. vii, 5.

[86] State Papers, Domestic. Eliz. ccxliv, 116.

[87] Fox, *op cit.* at 189.

Judging Monopoly at Common Law

The most important consequence of Elizabeth's concessions in the 1601 Parliamentary session was that the common law was called upon to settle the delicate constitutional issue of how far the Crown could be allowed to go in the pursuance of a policy of monopolies. The answer came in the infamous case of *Darcy v Allin – The Case of Monopolies* and represents a decisive strike by the common law courts against odious grants.

The monopoly in question was an exclusive privilege for the manufacture, import and sale of playing cards within the Realm. The grant was first made in 1576,[88] was reissued twice[89] and finally came into Darcy's hands in 1598. By the beginning of the 17th century it was wholeheartedly infringed,[90] and the Queen's proclamation of 1601 only accelerated this practice. Indeed, Darcy complained in June 1602 that many people took it for granted that the patent had been revoked and not just opened up to judgement by the law. The Privy Council stepped to his aid and issued an order confirming that the patent was still valid and that it would be upheld until adjudged void at law.

The case was tried in the Easter term of 1602, and judgment delivered shortly after Elizabeth's death the following year. The court considered that the Queen had been deceived in her grant, and the patent was proclaimed a dangerous innovation, contrary to statute, common law and the commonwealth. However, rather than condemning all monopolies, counsel for the defendant stated that:

> " ... where a man by his own charge and industry, or by his own wit or invention doth bring any new trade into the Realm, or any engine tending to the furtherance of a trade that never was used before: and that for the good of the Realm: that in such cases the king may grant him a monopoly patent for some reasonable time, until such subjects may learn the same, in consideration of the good that he doth bring by his invention to the commonwealth: otherwise not."[91]

---

[88] To Bowes and Bedingfield. Pat 18 Eliz pt. 1. of July 28, 1576

[89] In 1578 to Bowes and Bedingfield, and in 1588 to Bowes alone.

[90] Davies, *Further Light*, *op cit.* at 399-403 notes at least eight actions taken by the previous owners against infringers.

[91] *11 Co Rep 84b*, *77 Eng Rep 1260* at 1263.

The courts of common law confirmed this exception to the general illegality of monopoly grants in the 1615 case of the *Clothworkers of Ipswich*,[92] despite the fact that it had nothing whatsoever to do with the facts being tried.

Battles of a King

James I acceded to the throne shortly before the decision in *Darcy v Allin* was handed down. It may be for this reason that he began his reign on a note of caution concerning monopoly grants, issuing a proclamation suspending them all until they could be examined and assessed by the Privy Council.[93]

Despite such timid beginnings, James's reign is not notable for its stable and conservative attitude to monopoly grants, quite the reverse. The years of 1603 to 1625 mark a period of vacillation between caution and excess.[94]

Thus, on 16 March 1604 James issued an apology to Parliament over the surfeit of his grants, and promised to moderate his generosity, in addition he instigated the Commissioners of Suits to examine the merits of all applications. However, by 1606 the situation concerning monopolies was so bad that the Committee on Grievances presented a petition to the King at the close of the parliamentary session.[95] He undertook to revoke those patents of most concern, but in fact did nothing. In 1610 the Committee once again petitioned James, pointing to his lack of action and stating that in addition he had "failed in his undertaking that the courts should consider and judge of the validity of certain of the grants."[96] Shortly after this petition, the King issued what has become known as his *Book of Bounty*. This was a proclamation that all monopolies were against the laws of the Kingdom, excepting those concerning "Projects of new invention, so they be not contrary to the Law, nor mischievous to the State, by raising prices of commodities at home, or hurt of trade, or otherwise inconvenient."[97]

---

[92] *Godbolt 252*; *78 Eng Rep 147*.

[93] Soc. Ant. Proc. Coll. May 7, 1603, summarised in Price, *op cit.* at 163.

[94] Coke stating in a debate in the House of Commons in 1620 that, "Monopolies are now grown like Hydra-heads: they grow up as fast as they are cut off." 1 Parl. Hist. 1193 – quoted from Fox, *op cit.* at 93.

[95] State Papers, Domestic. Jac. I, xxiii, 66 and 67. The list is reprinted in Fox, *op cit.* at 329.

[96] Fox, *op cit.* at 95; see also Price, *op cit.* at 27.

[97] See Fox, *op cit.* at 330-335 for a complete reproduction of the proclamation.

From Bounty to Statute

The wording of the *Book of Bounty* makes it clear that James's advisors were familiar with the opinions expressed in *The Case of Monopolies* – indeed, Coke stated that the case was the principal motive behind the publication of the book.[98] The actual motivation of the King is, however, unclear. Fox suggests that James wished to convince the public that he had no intention of transgressing the principles of the common law and the limits of the prerogative, but adds that "the suspicion is inescapable that James was doing so, to a certain extent, with tongue in cheek, in an effort to lull the minds of the people into a feeling of security and with no real intention of limiting his own use of this facile tool for regulating trade."[99]

In the years immediately following publication of the *Book* complaints against monopolies continued unabated. However, the situation noticeably worsened in 1617 when Bacon, subordinate to Buckingham, replaced Ellesmere as Lord Keeper.[100] Whereas Ellesmere had been staunch opponent of improper grants, Bacon, under Buckingham's piratic gaze,[101] was less particular. In the autumn preceding the 1621 Parliament, perhaps prompted by the growing unease with which his grants were being viewed, James convened a Commission to investigate the question of monopolies. Fox suggests that it was this act that forced the issue to a head the opening of the 1621 Session.[102]

Parliament met on 30th January and extensive debate on public grievances occasioned by monopoly grants was undertaken. A Bill against monopolies was introduced to the House in March whereupon it was passed by the Commons, but failed to gain approval in the Lords.[103] Prompted by the agitation, the King issued a proclamation akin to Elizabeth's of 1601, stating that many privileges had been granted on false suggestions

---

[98] Coke, *Part III of the Institutes of the Laws of England*, (1817; Clarke & Sons, London; reprint) (hereinafter *3 Institutes*) at 182.

[99] Fox, *op cit.* at 97.

[100] See Price, *op cit.* at 30; Fox, *op cit.* at 100-101.

[101] "but Buckingham regarded [grants of patents] ... as a means of enriching his own family and providing for his dependents." Fox, *op cit.* at 101.

[102] Fox, *op cit.* at 102.

[103] Fox, *op cit.* at 106-7. Price, *op cit.* at 33 states that their Lordships did not object to it in principle, but considered the drafting to be unflattering to the King.

of benefit to the Realm, and that others had been the subjects of abuse. He referred to the *Book of Bounty* saying that he had previously written of his dislike of such grants and of those who seek to obtain them. He followed these comments by declaring 18 patents void, and opened up 17 others to trial by the common law, stating that:

> " ... if any subject should find himself grieved, injured, or wronged by reason of any of the said grants, or any clause, article, or thing therein contained, may take their remedy therefor by the common laws of the Realm, or other ordinary course of justice, any matter or thing in the said grants to the contrary not withstanding."[104]

However, James was not the monarch that Elizabeth was, and in 1623 Parliament renewed its onslaught. The *Statute of Monopolies* thus entered the statute books as Chapter 3 of 1623.[105]

The Statute of Monopolies

On almost every level the *Statute of Monopolies* merely restates the law as declared in *Darcy v Allin*, the *Book of Bounty*, and the *Clothworkers of Ipswich*.[106] In s.1 all monopolies are declared to be contrary to the law and utterly void. Section 2 states that all issues of validity are to be determined at common law. Section 3 provides that no one may

---

[104] Soc, Ant. Proc. Coll. July 10, 1621. Quoted from Price, *op cit.* at 168, the relevant portion of the proclamation being reproduced at 166-8; See also Fox, *op cit.* at 112; and MacLeod, *Industrial Revolution*, *op cit.* at 15.

[105] (1623) 21 Jac. I. cap. 3.

[106] As ever there is academic disagreement as to the extent to which the statute was merely declaratory of the common law. Inlow, *op cit.* at 31 concludes that the Statute introduced nothing new into the law: MacLeod, *Industrial Revolution*, *op cit.* at 17-18 suggests that it was little more than declaratory of the common law but "it converted previous prudential restraints into statutorily binding codes of practice": Hulme, *Sequel*, *op cit.* declared, at 55, that the Statute did little to alter the limitations already assigned by the common law except to provide a restriction of the term of the patent grant. See also Boehm, *The British Patent System: I Administration*, (1967, Cambridge University Press, Cambridge) at 17. Fox, *op cit.* appears confused, stating at 125 that "[t]he Statute of Monopolies was nothing more than a declaration of what the common law had always been.", but at 118 he states that the Statute marks a departure from the common law with respect to the limitation of the term of the grant and also concerning the forum in which the grant could be contested; and Holdsworth, *English Law*, *op cit.* Volume IV, at 353-4, similarly states that, in addition to the restriction of patent term, the Act gave new jurisdiction to the "common law courts to deal with disputes connected with these grants ..." However, as Walterscheid, *Antecedents II*, *op cit.* points out, at 875, the previous decisions of the common law in *Darcy v Allin* and the *Clothworkers of Ipswich* provide evidence that the jurisdiction given to the common law courts was not new under the Act.

exercise any monopoly right previously granted. In s.4 remedies are detailed for any party judged by the courts of common law to be aggrieved by a monopoly. Sections 5-14 contain exceptions to s.1; the most famous of which is s.6, which provided the only statutory basis for English patents granted during the next 200 years.[107] The section states:

> " ... any declaration before mentioned shall not extend to any letters patent and grants of privilege for the term of fourteen years and under, hereafter to be made, of the sole working or making of any manner of new manufactures within this Realm, to the true and first inventor and inventors of such manufactures, which others at the time of making such letters patent and grants shall not use, so as also they be not contrary to law, nor mischievous to the State ... "

Section 5 similarly exempted grants previously made, providing they satisfied similar requirements and did not extend beyond 21 years.

Commentary

Sir Edward Coke provides contemporary commentary on the *Statute* his *Institutes on the Laws of England.*[108] He lists 7 properties that a patent must possess to be valid under s.6. The first five – the grant must not exceed 14 years; it must be made to the first and true inventor; it must be for those manufactures "which any other at the making of such Letters Patent did not use"; it must not be contrary to law; and it must not raise prices of commodities and therefore be "mischievous to the State" – are taken from the *Statute* itself. The final pair – the patent must not hurt trade; and that it must not be generally inconvenient – although not mentioned in the Statute are consonant with Elizabethan policy. He then states that where such criteria are fulfilled, the grant of a patent will be good in law as "the inventor bringeth to & for the Commonwealth a new manufacture by his invention, cost and charges, and therefore it is reason[able], that he should have a privilege for his reward (and the encouragement of others in the like) for a convenient time."[109] Thus, we see the first explicit policy justification for the patent grant.

In addition, Coke asserted that "[i]t appeareth by the Preamble of this Act (as a judgement in Parliament) that all grants of monopolies are against the ancient and fundamental laws of this kingdom", and that all "monopolies are against the ancient and

---

[107] And interestingly still resides on current statute books.

[108] *3 Institutes, op cit.* at 181-2.

[109] *Ibid.* at 184; See also Walterscheid, *Antecedents II, op cit.* 877.

fundamental laws of the land."[110] The latter phrase has served to colour the patent grant ever since. However, it is clear from both *Darcy v Allin* and the *Clothworkers of Ipswich* that the right of the Crown to grant monopolies of new trades or manufactures to those responsible for their introduction to the Realm (whether by importation of skill or ideas, or by 'contrivance') was always recognised at common law as part of the Crown prerogative. Nonetheless, as monopoly is the antithesis of the common right of freedom of trade, which all men are to enjoy as their birthright, the prerogative right to grant monopolies was, at least in theory, limited at common law to grants where consideration moved to the public. Even where this transfer of consideration was not in evidence, as long as a grant could be shown to be in the best interests of the Realm its validity would be recognised.[111] Therefore, even after the ruling in *Darcy v Allin* it is clear that to omit the caveat relating to new invention and to condemn all monopolies on the ground that they have ever been against the ancient and fundamental laws of the land is an unsustainable argument.

The True Significance of the *Statute*

The *Statute of Monopolies* forms a handy legislative marker from which to hang a picture of the neat and orderly growth of the modern patent system. As such it has been embraced into the folklore of patents and hailed as marking the beginning of the modern patent grant, a position of prominence that it does not deserve.[112]

The picture of a patent system *caused*, or even accelerated, by the *Statute of Monopolies* is wrong for a number of reasons. First, it has been shown that not only was there a controlled policy of patent grants in England before the passage of the Act, but also

---

[110] *3 Institutes*, *op cit.* at 181.

[111] See, for example, patents for the sole production of saltpetre and ordnance granted by Elizabeth and continued under James which also gained exception to the general prohibition of monopolies in the *Statute* of 1623 by virtue of s.10 of the same. See also Fox, *op cit.* at 60.

[112] It is evident that the folkloric transition occurred sometime during, or just after, the Patent Controversy of the 19th century (see Chapter III, below) as in the Report of the Select Committee on Patents of 1829 the Statute is treated roughly equally with An Act Containing the Censure given in Parliament against Sir Francis Mitchell, Francis Viscount Saint Albane Lord Chancellor of England and Edward Flood (18 Jac. I. cap. 1 (1621)) and An act to Confirm a Judgement given in Chancery for Annulling Certain Letters Patent Granted to Henry Heron, for the Sole Privilege of Salting, Drying and Packing of Fish within the Counties of Devon and Cornwall (21 Jac. I. cap. 11 (1623)). See Bently & Sherman, *op cit.* at 208.

there is evidence of a statutory regime that predates it by approximately 150 years.[113] Second, the *Statute* was for the most part merely declaratory of the common law; indeed it receives derisory treatment on this very issue in the report of the 1829 Select Committee on Patents.[114] Third, the *Statute of Monopolies* enjoys the peculiar distinction of having almost no impact on the development of English patent law for the next 100 years. As Walterscheid states, "for all intents and purposes there was no development in the common law relating to patents of invention during the next century."[115]

Seen in this light, the true significance of the *Statute of Monopolies* lies solely in its prohibition of the unfair monopolisation of a known trade. The underlying policy of Elizabethan grants is still evident and the general concept of encouraging the implementation of new manufacture is never questioned. Indeed, the *Statute* can be seen to stand apart from the adoption of any such policy, instead functioning to keep guard for potentially unjustified and capricious barriers to free trade. Its primary objective was, after all, to restrain a King gone wild in his grants in order that 'odious monopoly' be avoided or nullified. It is therefore little more than enduring testament to the sanctity of free market dealing.

A Legislative Aftermath

The *Statute of Monopolies is a response to a little more than half a century of bad feeling* towards abuses of monopoly privilege. Its chief contribution was to clarify the existing English law and to reinforce the position taken by the courts until this time. As Bugbee states, "[w]hile only incidentally concerned with ... [patents of invention] ... the Statute provided a firmer legal basis for clearing away the bad company with which [they] had been forced to travel."[116] It did not create a new law of patents of invention; it merely allowed them to continue to exist, saved from the stifling effect of the "weedlike growth of monopolies."[117]

---

[113] i.e. the *Statute of Venice.*

[114] Report of the Select Committee on the Law Relative to Patents for Inventions (1829) Parliamentary Papers III (Command Paper Nº 332). See text accompanying note 112 above.

[115] Walterscheid, *The Early Evolution of the United States Patent Law: Antecedents (Part 3)*, (1995) 77 JPTOS 771 (hereinafter Walterscheid, *Antecedents III*) at 771.

[116] Bugbee, *op cit.* at 39-40.

[117] *Ibid.* at 40.

However, the story of 'odious monopoly' does not end here. Such grants continued to aggravate English politics for some decades after the *Statute*'s enactment. The source of contamination is, with hindsight, immediately recognisable when the *Statute* is examined, for not only did it exempt patents of invention, but also significant other grants concerning industries considered essential to the Realm, including saltpetre, alum, ordnance, shot, and gunpowder.[118] Furthermore, in s.9 it was provided that grants made to "any Corporations, Companies or Fellowships of any Art, Trade, Occupation, or Mystery, or to any Companies or Societies of Merchants within this Realm, erected for the maintenance, Enlargement or ordering of any Trade of Merchandize..." be similarly excused from the wholesale condemnation of monopoly.

The effect of these provisions was to allow a financially insecure Crown to confer favour and sell additional monopolies of these types without infringing the *Statute*. Thus, monopoly abuse had been limited, but not extinguished by Parliament, and public condemnation of such activities naturally spilled over onto the legitimate operation of grants to inventors.

Issues of Jurisdiction

Further problems arose concerning uncertainty over the exact jurisdiction of the courts of common law in matters concerning letters patent for invention.[119] The problem arose because of the wording of s.6, which stated that "any declaration before mentioned shall not extend" to patents of invention meeting the requirements set out later in the section. The question that perplexed courts and scholars alike was whether this meant that such patents were also excused from the requirements of s.2, which provided that validity of any monopoly should be determined in accordance with the common law.

If it was the object of the *Statute* to transfer jurisdiction for patents of invention to the courts of the common law, it failed in spectacular fashion. Fox asserts that only one patent case is reported at law during the rest of the 17th Century, and only one more

---

[118] Sections 10 and 11.

[119] This incertitude also goes some way to explain the hiatus in development of the law concerning patents for invention evident in the century after the enactment of the Statute. See further Walterscheid, *Antecedents III*, *op cit.* at 771.

appears in the period from 1700 until 1765.[120] This period was not, however, devoid of litigation concerning letters patent for invention, such matters were simply tried in conciliar courts, as was common practice before the *Statute*. It was simply "not thought fitting or consonant with the royal dignity that questions concerning [the] propriety [of such grants] should be discussed and considered in ordinary courts of common law."[121]

In addition, it appears, at least in part, that grants were not turned over to the common law at this time due to the interference of Parliament, which seems to have adopted the habit of periodically reviewing the validity of patent grants.[122] This practice seems to stem from sustained concern over the issue of 'odious monopoly'. However, rather than being seen as safeguarding the interests of society, the procedure served mainly to further undermine trust in the system.

Another factor keeping the common law away from patents for invention was the fierce territoriality of the Privy Council. Shortly after the passage of the *Statute of Monopolies*, the Council made its views on the supposed common law jurisdiction very clear when it intervened in a case concerning a challenge to Sir Robert Mansell's glass patent. Not only did it state that there was to be no encroachment on Mansell's rights until a suit at law had been decided, but more importantly, it later also removed the right of trial at law. The Council pronounced: "The Lords declare that the patent shall stand ... They think it of Dangerous consequence and trenching upon the prerogative that patents granted on just grounds and of long continuance should be referred to the strict trial of common law, wherefore they order that all proceedings be stayed."[123] Given this clear message, it is hardly surprising that there was little resort made to the courts of common law in the following decades.

---

[120] Fox, *op cit.* at 119. MacLeod is more cautious, stating that the "compilations of judicial precedents are totally silent on patents for the period 1614 – 1766, except for a brief reference to [a 1691 case]", however she continues to say that there is evidence to suggest that some cases may have gone unreported, *Industrial Revolution, op cit.* at 68-9.

[121] Fox, *op cit.* at 120.

[122] See Walterscheid, *Antecedents III, op cit.* at 773; also Fox, *op cit.* at 123.

[123] State Papers, Domestic, December 6 1626; Quoted from Walterscheid, *ibid.* at 774.

The break in the Privy Council's hold over matters patent came suddenly in 1756 when it made a determination to divest itself of authority in issues of validity.[124] Finally the common law was able to begin to establish law relating to patents of invention. However, the going was far from smooth, common law judges being forced to "pick up the threads of the principles of [patent] law without the aid of recent and reliable precedents."[125]

The result was uncertainty as to the nature of patent law, as "few cases meant few precedents, and few precedents generally meant uncertainty,"[126] and distrust of a system that appeared to be capricious from without. Failures, patents deemed unworthy of protection when reviewed at law, were more famous and more frequent than successes, and confidence in the system fell to a new low.[127]

Pressure for Change

Thus, a picture of the system of the early-to-mid-18th century emerges. Monopoly had maintained its 17th century 'odious' title. Patents of invention had failed to lose the tainted moniker of monopoly, and were viewed with distrust and hostility. Abuses continued, and for the first half of the new century, the Privy Council maintained its jurisdiction over issues of validity. When at last release came, rather than improving the situation, it made things worse as the change of jurisdiction created additional uncertainty. The common law was forced to operate without precedent and became viewed as 'hostile' by the patentee. Confidence in the system, always a precious commodity, had ebbed slowly away. Furthermore, society was unsure of what the patent law actually was. Dissatisfaction was rife.

---

[124] See Walterscheid, *ibid.* Also Hulme, *Privy Council Law and Practice of Letters Patent for Invention from the Restoration to 1794, (1917) 33 LQR 63* continued at *180* (hereinafter Hulme, *Privy Council*), at 194; and Holdsworth, *English Law, op cit.* Volume XI, at 426.

[125] Hulme, *Consideration, op cit.* at 318. It should be noted that the doctrine of precedent, sacrosanct within modern English law, was itself in its infancy. Case reports such as they were, were unofficial and could be discounted by judges. Conflicting decisions could and did exist side by side. For a more in-depth treatment of the doctrine of precedent see Kempin, *Precedent and Stare Decisis: The Critical Years, 1800 to 1850, (1959) 3 Am J Leg Hist 28.*

[126] Dutton, *The Patent System and Inventive Activity During the Industrial Revolution 1750-1852*, (1984; Manchester University Press, Manchester) at 70.

[127] Dutton, *ibid.* at 79 states that during the period from 1750 to 1799 only 39% of common law cases were decided in favour of the patentee.

Concerns over the security offered by patent protection had conspired to produce an essentially binary valuation of patent grants. Most patents were considered unsafe, expensive and unattractive to the inventor. However the lure of certain patents, specifically those regarded as being more secure – typically taking the form of a grant that had survived challenge at common law – gave hope, and became incredibly valuable. Prospective patentees were therefore given great incentive to invent methods of making their grants more resistant to challenge. One such idea, which had been used erratically and generally unsuccessfully in the 150 years following the formation of the Elizabethan policy, was to accompany the petition with the enrolment of a manuscript detailing the invention and the extent of protection desired. It was this concept of specifying the subject matter of the grant that was eventually to gain favour with both patentees and the courts, and to serve to accompany the patent grant through a transition from object of Royal patronage into a *bona fide* tool of commerce.

Consideration Revisited – The Birth and Growth of the Specification

The requirement that patentee disclose their invention to the public in return for a grant is a concept deeply ingrained in modern patent law. However, as has been shown, this has not always been the case. Indeed, it took more than two centuries from the crystallisation of Elizabethan patent policy for the provision of a specification to be required by the common law.

Under early English patent custom the consideration required to validate a grant in opposition of free trade was usually promise that the subject matter would be introduced into the Realm. The methods employed in furtherance of this aim included using clauses obliging the patentee to 'work' the invention, others requiring the employment of a certain number of native apprentices, and the all-encompassing 'revocation for inconvenience' clause.[128] By the closing years of the 18th century, the price that the patentee had to pay for the monopoly was the provision of a specification.[129] Gone was the requirement to institute manufacture, and in its place stood a far wider obligation to disseminate new skills to the public in general.[130]

---

[128] See text accompanying note 64 *et seq.* above.

[129] See comments to this effect in *Boulton & Watt v Bull*, 2 H BL 463, 126 Eng Rep 651 at 656.

[130] Walterscheid, *Antecedents III*, *op cit.* at 792.

From Introduction to Explanation as the Price of Monopoly

There is a general consensus amongst commentators that the first enrolment of a specification can be found in Nasmith's patent of 1711.[131] However, there are a number of earlier grants which, although they cannot be said to have gone as far as Nasmith, nonetheless show that such a development was not as startling or original as some may claim.

The earliest is an agreement between the Crown and Gerard Honricke, a German sea captain, in which he promised that in return for £300 he would "teache perfectlie by demonstracôn and practice with the hand without all manner of decipte and falsehood the said arte of makinge salte peter in the moste perfecte sorte."[132] The pact between the Crown and the German required that he should submit, within a specified time, written directions for its production. This he did, and it is this document, reproduced in the State Papers for 1561 under the title of "The trew and perfecte arte of the making of Saltpeter to grow in Cellars, Barns, or in Lyme or Stone quarrees"[133] that Hulme contends is the first example of a specification.[134] However, as Davies notes, there are a number of reasons why this cannot be so, the most important of which being the fact that Honricke was never awarded a patent, indeed he never asked for one, he merely offered to sell his knowledge.[135]

Fifty years after Honricke's recipe was published an even more important precursor of the modern specification can be found in the publication of Simon Sturtevant's 'Treatise on Metallica.' It appeared in 1612 in accordance with a covenant made between Sturtevant and the Crown in the application for a patent. Although more in the way of an advertising prospectus than a specification,[136] it is of interest for

---

131 See MacLeod, *Industrial Revolution*, *op cit.* at 49; Dutton, *op cit.* at 75; Gomme, *op cit.* at 27; Davies, *Early History*, *op cit.* at 87; Adams & Averley, *The Patent Specification – The Role of Liardet v Johnson*, *(1986) 7 J. Leg. Hist. 156* at 158; and Walterscheid, *ibid.* at 782.

132 Quoted from Davies, *Early History*, *op cit.* at 263-4. See also Klitzke, *op cit.* at 640-41 and Hulme, *Prerogative*, *op cit.* at 145.

133 State Papers (Domestic), Eliz., XVI, 29-31.

134 Hulme, AALH, *op cit.* at 142.

135 Rights under this bargain were later transferred to Cockeram and Barnes who were granted a ten-year monopoly, but they didn't have to provide a specification.

136 Davies, *Early History*, *op cit.* at 266-7; also Price, *op cit.* at 108.

Sturtevant's reasons for its provision. He explains that its provision was deemed necessary so that:

> "(1) ... it might appear his inventions were new, and of his own devising, and not stolen from any other; (2) that the endeavours and inventions of other men, being different from his own, might not be prevented by him; (3) that none other should hereafter presume to petition His majesty for inventions identical with those described by him; (4) that he was bound by the proviso (that he had caused to be inserted) in his grant, whereas he was not tied to any time for the trial of his inventions."[137]

Thus it is clear that the ideas behind the provision of a specification were not new at the time of Nasmith's patent, and had in fact been advanced some 100 years previously, albeit in a climate not yet ready to accept such a change.[138]

Davies contends that five grants of James I requiring the submission of models[139] or descriptions are more deserving of the title of first specification, although still not enough for its award.[140] It is not known whether these requirements were made for the benefit of the Crown, to enable the Law Officers to determine more exactly the nature of the grant made, or for the benefit of the patentee, for their own protection. Indeed, it is possible that it may have been both. However, it is significant that these grants all occurred in the period between the *Book of Bounty* and the *Statute of Monopolies*, a time marked by growing unease in the public perception of monopolies. Therefore, the provision of models may also have been an attempt to assure the validity of such grants in the eyes of the public by illustrating that they did not cross the line between permitted and 'odious' monopoly. This view is reinforced by a resurgence the practice under Charles I shortly before the civil war,[141] a time of great opposition to monopoly policy.[142]

---

[137] Davies, *Ibid.*

[138] Thus, notwithstanding Sturtevant's admission that he was not tied to any time limit for the introduction of his inventions due to the publication of his treatise (point 4. of his reasons), his patent was revoked in following year due to his outlawry and failure to work it.

[139] Meaning designs or descriptions of structure.

[140] Davies, *Early History, op cit.* at 268-9.

[141] *Ibid.* at 271.

[142] Fox, *op cit.* at 128-9.

In addition to these early-17th century examples, there are a number of references to the annexation of models, schemes, drafts and discourses to patents after 1670.[143] However, it is apparent that "these few precursors of the patent specification were seeds that fell on rocky ground, for apart from them we have found no suggestion in the patents of the seventeenth century of the coming of the novel provisions in Nasmith's patent of 1711 which really originate the history of the modern patent specification."[144]

The Novelty of Nasmith.

It has been deduced from the wording of Nasmith's patent that the most likely explanation for his provision of a specification is that it was for his own security and protection, to make the scope of his grant more certain.[145] In support of this view is an argument relating to concerns expressed over the common practice at this time of inventors entering caveats with the law officers to alert them of petitions in fields of their interest.

Caveats were notices that could be entered onto a register at any time prior to the sealing of a patent. They had the effect of preventing the grant until the objector's arguments had been heard. When a request for a patent was made the caveat book would be searched and a hearing would be held between the petitioner and the caveat holder. The opposition would state the current art and his understanding of the work in the field. The patentee would describe the exact nature of his invention. Based on the information provided, the law officer would decide whether to go ahead with patent or not. It was, in effect, a preliminary trial.[146]

Caveats saw a lot of use, and it appears that there was widespread belief that the system could be used to obtain knowledge of pre-grant patents and therefore provide an

---

[143] Of which, the most famous are those of Dud Dudley, who published "Metallum Martis" in 1665 – reproduced in Price, *op cit.*, at 108-111 – and the Earl of Worcester who issued a prospectus of his "most stupendous Water-Commanding Engine in 1663, see Davies, *Early History, op cit.* at 272.

[144] Davies, *ibid.*

[145] See Hulme, *Consideration, op cit.* at 317.

[146] See Walterscheid, *Antecedents III, op cit.* at 790; and Davies, *Early History, op cit.* at 107.

opportunity to steal the inventions before the patent could be issued.[147] This fear found footing in the *Statute of Monopolies*, which stated that a grant would only be good for manufactures "which others at the time of making such letters patent shall not use."[148] Therefore, if anyone obtained knowledge and practised a patent before its grant, it could be avoided through caveat opposition or through a writ of *scrie facias*. It was of no consequence that the information was obtained by fair means or foul.[149] Nasmith's statement that he "thinks it not safe to mention in what the New Invention consists until we shall have obtained our Letters Patent"[150] clearly demonstrates that this fear was at the fore of his mind when petitioning for protection.

However, detracting from the argument that the patentee introduced the specification to make the grant more certain is the fact that the majority enrolled at this time were hopelessly vague.[151] Davies also cautions against conclusions drawn from heavy reliance on the exact language used in such patents as "examples could be given ... of suggestions which emanated from the Crown being embodied in patents in language which suggests that they were originally made by the patentee – or *vice versa*."[152] Therefore, although compelling, it is impossible to state with certainty that the specification was enrolled at Nasmith's request. Indeed, because its first mention appears in the report of the law officer dealing with the petition it may be deduced that the initiative came from the Crown; the officer requiring a better disclosure before he would issue a favourable report.[153] MacLeod states that it is likely a request of a

---

[14] Dutton, *op cit.* at 35, 183; Davies, *ibid.* at 92, Gomme, *op cit.* at 23; Walterscheid, *ibid.* at 790; and MacLeod, *Industrial Revolution*, *op cit.* at 43.

[148] Section 6. Reproduced at note 107 above.

[149] See Walterscheid, *Antecedents III*, *op cit.* at 791.

[150] Quoted from Walterscheid, *ibid.*

[151] See Adams & Averley, *op cit.* at 161; also MacLeod, *Industrial Revolution*, *op cit.* at 49, who states that the specification, at this time, could be as informative or evasive as the patentee saw fit.

[152] Davies, *Early History*, *op cit.* at 91.

[153] See Walterscheid, *Antecedents III*, *op cit.* at 788; and Gomme, *op cit.* at 33. The role played by the law officers in the grant at this time was significant. Hulme, *Sequel*, *op cit.* states, at 53, that their influence in deciding patent grant policy began around the beginning of the 17th century. MacLeod, *Industrial Revolution*, *op cit.* at 48 suggests that in the century after 1660 all modifications in the patent system were made by them in the course of reporting on inventors' petitions. Walterscheid, *Antecedents III*, *op cit.* at 779 states that by the 17th century the participation of the law officers in deciding patent policy was becoming standard practice.

specification was made in many such cases to make discrimination between superficially similar inventions easier.[154]

However, it is eminently possible that both views have a claim to the truth. The fear of inventive theft was well grounded, and the path towards the specification had already been explored in disputes akin to *Garill's case* in the Privy Council in 1664[155] and by publications such as Sturtevant's 'Treatise on Metallica'. In the former, the injustice and inconvenience caused by the lack of a description of the nature of the patentee's invention was highlighted, and the enrolment of a specification after grant suggested. As Davies states, although not taken up in the case, it forestalls Nasmith by 50 years.[156] It is therefore not unreasonable to conclude that *Garril's case* paved the way and formed a link in the chain of developments leading to present law. Furthermore, Sturtevant's 'Treatise' is clear evidence that the Crown would already have been aware of the argument in favour of the enrolment of a specification.

More practical reasons for its late development can also be made. Most commentators rely on the argument that it was not until the time of Nasmith's patent that inventions were actually *capable* of being described in a specification. Hulme and Davies, for example, state that before this time in essence what were being introduced were not simple mechanical inventions but rather whole new industries, the description of which "would have required a treatise rather than a specification."[157] Hulme goes further, stating that as long as the system was aimed at the introduction of new industries the requirement of a specification would have "materially detracted from the concession offered by the crown, besides constituting a precedent for which no sufficient reason or authority could be adduced."[158] Gomme[159] and MacLeod[160] state that technical literature was in its infancy in the 18th century, and therefore imply that requiring a specification

---

[154] MacLeod, *Industrial Revolution*, *op cit.* at 51.

[155] This was a dispute heard in the Privy Council relating to a proposed patent to John Garill. For a fuller account of *Garill's* dispute see Davies, *Early History*, *op cit.* at 274.

[156] Davies, *ibid.*

[157] Hulme, *Consideration*, *op cit.* at 317; see also Davies, *Early History*, *op cit.* at 97 and 263; this is one of the few points on which the two appear to agree.

[158] Hulme, *ibid.*

[159] Gomme, *op cit.* at 26.

[160] MacLeod, *Industrial Revolution*, *op cit.* at 49.

before this time, even if considered a desirable option, may have been beyond the scope of the majority of patentee's talents.

Walterscheid, on the other hand, rebukes these arguments as too simplistic as, "many of the Elizabethan grants cannot be said in any reasonable way to have encompassed the introduction of whole new industries."[161] He continues, asking why "the nature of inventions should have remained unchanged for more than 150 years and then suddenly change sufficiently to require a formal disclosure of the invention in the specification[?]"[162] Taking these points in turn: Whilst many Elizabethan grants were not for entire industries, it is clear that the majority were for more than simple mechanical inventions capable of straightforward description. In addition, it is submitted that Walterscheid's second argument entirely misses the point, for it is not suggested that the kind of invention that was patented changed overnight. Rather, that by this point in time conditions were such that it was *far less likely* that protection would be sought for the introduction of an entire industry. This argument is backed up by the fact that even after the provision of a specification was made a routine condition of grant there is at least one case in which exemption was granted.[163]

Walterscheid further argues that for as long as 'working' of the invention was the main Crown priority the idea of a specification was of little importance. Therefore, the rationale for not requiring one under early English patent custom came more out of a "concern by the Crown and the patentee to avoid legal arguments about the propriety of the grant than anything else." Moreover, not making the requirement was, in the main, an attempt to protect the royal prerogative to its fullest extent.[164]

However, all of these arguments seemingly fail to appreciate that no 'one' reason can be given for why the specification was not introduced at an earlier point in history. Rather, a gradual change in the type of invention, the fact that 'working' clauses had been removed, the use of the caveat system, and patentee's concerns to make their grants more certain, amongst other reasons, all conspired to form an environment conducive

---

[161] Walterscheid, *Antecedents II*, *op cit.* at 860.

[162] *Ibid.*

[163] See Davies, *Early History*, *op cit.* at 90.

[164] Walterscheid, *Antecedents II*, *op cit.* at 862.

to the enrolment of a specification. It cannot be said that any one of these factors was responsible for Nasmith's revolution. It was their combination in the social, political and economic context of the day that formed what might be termed the "inventive step" of the specification.

A Mark of Evolution

The uncertainty over the scope and substance of patent grants that had been evident from before the *Statute of Monopolies* and that was to continue for decades after the advances marked by Nasmith's patent is the inevitable result of an evolution within the patent sphere and within society. The system had begun with grants that were semi-contractual agreements between the patentee and the Crown, whereby protection was offered in return for the introduction of new manufacture. This practice had evolved into offers of exclusive privilege where the Crown, consonant with a policy of improving the Realm, provided limited monopoly rights in exchange for the introduction of new industry. In essence, "patents originally represented royal privileges issued under the royal prerogative to achieve royal policy goals."[165] However, first *Darcy v Allin*, then the *Clothworkers of Ipswich*, and most importantly the *Statute of Monopolies*, had made tentative but significant steps towards containment of the Monarch's power in this area. This necessitated a shift away from patents being seen as royal privileges and towards their being viewed in the context of the common law and legal rights. In short, patents at this time were slowly coming to be seen as tools of commerce within the market economy.

A Practice Accepted

Nasmith's application was made in a period of confusion within the English patent system. Time and civil war had muted the public furore over 'odious' monopolies, leaving a general distrust in their wake. The requirement that the invention be introduced to the Realm within a specified period had disappeared in practice.[166]

---

[165] Mossoff, *Rethinking the Development of Patents: An Intellectual History, 1550 – 1800*, (2001) 52 Hastings L. J. 1255 at 1274.

[166] See Hulme, *On the History of the Patent Law in the Seventeenth and Eighteenth Centuries*, (1902) 18 LQR 280 at 283 states that by about 1673 the "obligation institute the manufacture ... had disappeared from the contract (unless voluntarily introduced by the applicant)". MacLeod further states that in the context of post 1660 grants that non-implementation "did not normally give cause for voiding an English Patent.", *Industrial Revolution*, *op cit.* at 21. See also Walterscheid, *Antecedents III*, *op cit.* at 786.

Moreover, the utilisation of '*non obstantibus*' (notwithstanding) clauses meant that it was not necessary to include a description of any kind with the patent, as the subject matter receiving protection was that actually used by the patentee.[167] Furthermore, great uncertainty had been injected by the unsettled issue of jurisdiction concerning patent disputes, the courts of common law not yet having taken up position as sole arbiter of the system as promised by the Statute of Monopolies.[168] With these issues in mind, it is unsurprising that Nasmith's patent gave no actual guidance as to what a specification should contain. Therefore, at this point in time, and for many years after "it is doubtful whether patentees had any clear idea what the function of a specification was or how full and accurate it ought to be."[169]

However, despite this uncertainty, the concept of bargaining for protection with a written disclosure gained favour, both with patentees, possibly eager to make their grants more certain, and with the law officers of the Crown, without whose favourable report a patent would not be granted. The provision of a written specification detailing the invention therefore became accepted as the price that the patentee should pay for the privilege of protection from imitation.[170] Thus, the practice of requiring a specification became customary in about 1734.[171] However, it took the common law another four decades to establish its grip on the system, and to openly accept the death of the doctrine of introduction, instituting the requirement of a specification in its place.

---

[167] See the opinion of Sir William Jones, Attorney General, in 1676 that the description of the article within the patent was not necessary, it could be constructed as the patentee saw fit, but once set up and used, that was the sole model protected by the patent. Referred to in MacLeod, *Industrial Revolution*, *op cit.*, at 62; and Walterscheid, *Antecedents III*, *op cit.* at 786.

[168] It will be recalled that the Privy Council finally conceded authority in patent matters in 1756. See text accompanying note 124 above.

[169] MacLeod, *Industrial Revolution*, *op cit.*, at 50.

[170] Thus Hulme, *Privy Council*, *op cit.* gives example of patent set aside in 1732 for failure of specification to set forth nature of invention; at 188-9.

[171] Hulme, *(1902) 18 LQR 280* at 283 states that the first requirement for a specification can be found in a patent of 1716, but that the practice was not uniform until about 1740; Davies, *Early History*, *op cit.* at 89 states that the practice was made customary in 1734 but that there are examples of the requirement being made in 1712, three times in 1716, twice in 1717, twice in 1718 and that between 1720 and 1733 a further 15 specifications were required· Gomme, *op cit.*, at 34 says that between 1711 and 1734 (when the practice became customary) 29 of 158 grants had a specification enrolled.

Therefore, in 1778 Nasmith's small step was finally translated into a great leap for the common law in the landmark case of *Liardet v Johnson.*[172]

Liardet v Johnson

Liardet v Johnson has been variously described as a "landmark in the history of English patent law"[173] and dismissed as insignificant.[174] However, its status as the first reported case in which the courts of the common law expressly required an enabling disclosure marks it out for attention.

The patent in question concerned a new composition for stucco, a type of cement. It was granted in 1773 with the, by then, usual proviso that a specification would be enrolled, in this case within four months.[175] The patent was later assigned to the Adams family who, in 1776, "reassigned it to Liardet so that he could seek an Act of Parliament extending its term."[176] The term was subsequently extended to 18 years, on the condition that Liardet enrol a further specification detailing improvements made to the cement since the original grant. This was done in September 1776, and Adams, although no reassignment of the patent had taken place, continued to use the protected stucco.[177]

In May 1777, Liardet and four Adams Brothers filed a suit in equity against Johnson, Downes and Bellman seeking an account and injunction. Johnson replied by producing an affidavit implying, without expressly stating so, that Liardet's preparation was not novel, and in addition that Johnson's composition was materially different from that protected by the patent. In July 1777 an injunction was granted restraining Johnson from making, using, or vending the composition, on the proviso that an action was brought promptly at law.

---

[172] Reports of the first trial were published in the *Morning Advertiser* and the *Daily Post* on 23rd February, 1778, and in the *London Chronicle* and the *Daily Advertiser* the following day. The second trial is reported in the *Morning Post and Daily Advertiser, The Gazetteer* and the *New Daily Advertiser* on 20th July 1778. See Adams & Averley, *op cit.* 174. The case is reported at *(1780) 1 Y & CC 527*.

[173] Hulme, *Consideration, op cit.* at 317.

[174] Adams & Averley, *op cit.*

[175] It was enrolled on 3rd August 1773. Adams & Averley, *ibid.* at 162.

[176] Walterscheid, *Antecedents III, op cit.* at 795.

[177] Both Adams & Averley, *op cit.* at 162, and Walterscheid, *ibid.* state that Liardet acquiesced in this use.

Johnson replied to the injunction at the beginning of September 1777, stating that Liardet was not the inventor of the composition, or any 'imaginary improvements' over earlier stucco.[178] He further denied that his invention infringed the Liardet patent, but rather improved upon a known manner of manufacture by the addition of specific ingredients,[179] and stated that he had inspected the second specification to make sure.

Liardet and the four Adams brothers then instigated action at common law. The case was first tried before Lord Mansfield on Saturday 21st February, 1778. It lasted merely six hours, the jury returning verdict for the plaintiff.

Unfavourable public comment, that Adams & Averley suggest may have been caused by the fact that the plaintiffs had stuccoed His Lordship's house with the composition some years earlier, may have prompted Mansfield to grant a new trial, despite the fact that little, or no, new evidence was adduced.[180] The case was therefore resubmitted and heard before Mansfield once more on the 18th July 1778.

It is Mansfield's charge to the jury in this, the second of the *Liardet v Johnson* cases, that is of primary interest to our discussion of the evolution of patent law at this time.[181] Three questions were asked. First, had the defendant used the composition? Second, if he did use it, was the invention new or old within the definition given in the *Statute of Monopolies*? Finally, was the specification such as to instruct others how to make the composition? He continued:

> "For the condition of giving encouragement is this: that you must specify upon record your invention in such a way as shall teach an artist, when your term is out, to make it – and to make it as well by your directions: for then at the end of the term, *the public shall have benefit of it.* The inventor has the benefit during the term, and the public have the benefit after... [Where the invention is a composition] the specification must state ... the proportions; so that any other artist may be able to

---

[178] He cited entries in *A new and Universal Dictionary of Arts and Sciences* published by John Hinton in 1751, and to the second edition of this work published by a Mr Owen in 1764, as well as Charles Rawlinson's patent for a composition for slate on roofs, published in his own *Directory for Patent Slating* in 1772 in order to substantiate such a claim.

[179] Namely serum of ox blood.

[180] Adams & Averley, *op cit.* at 164.

[181] Although see Adams & Averley, *ibid.* at 171 who suggest that the novelty of the case lies in its reliance on the testimony of expert witnesses.

> make it, and it must be a lesson and direction to him by which to make it. If the invention be of any other sort, to be done by mechanism, they must describe it in a way that an artist must be able to do it."[182] (emphasis supplied)

As Walterscheid astutely states, this was "*one* of the earliest statements by an English judge of the modern requirement that a specification must be enabling."[183] (emphasis supplied). However, he is quick to note at least one earlier case in which Mansfield discussed the adequacy of the specification[184] – suggesting that *Liardet v Johnson* may not be as novel as the folklore of patents would infer.

Conclusion

Novel, or not, *Liardet v Johnson* is, at least, evidence of an important step having been taken in English patent law. It reminds the patentee of the importance of an enabling disclosure and paints the patent grant as a contract with the public in which temporary monopoly is exchanged for benefit accruing from the inventor's knowledge entering the public domain. Further, the case was one of the first on such matters to receive widespread coverage in newspapers and pamphlets. Thus it distributed the message to the public at large, rather than simply to a small circle of interested parties.[185]

By the end of the 18th century, *Liardet v Johnson* was settled law, and the patent had finally started its separation from grants of Crown favour. It had entered the market economy as an item of commerce, and the price was disclosure.[186] By this time it was apparent that the patent should teach the operation of the invention without further experimentation,[187] such a defect being grounds for avoiding the grant.[188] The working of the invention *per se* was no longer sufficient consideration for the award of a

---

[182] Quoted from Hulme, *(1902) 18 LQR 280*, at 285.

[183] Walterscheid, *Antecedents III*, *op cit.* at 797.

[184] *Ibid.*

[185] See Mossoff, *op cit.* at 1293; also Hulme, *Consideration*, *op cit.* at 284 where he lists some of the literature in which the case can be found.

[186] Buller. J. was therefore able to definitively state in 1795 that the "specification is the price that the patentee is to pay for the monopoly." *Boulton & Watt v Bull*, *2 H BL 463*, *126 English Reports 651* at 654.

[187] See, for example, *Turner v Winter*, *1 TR 601*, *99 English Reports 1274* at 1276.

[188] It should be noted that a specification could equally be defective if it included too much as if it disclosed too little. This was especially the case if the superfluous material was thought to be included for the purpose of misleading the public – see Walterscheid, *Antecedents III*, *op cit.* at 802 where he discusses R *v Arkwright*, *1 Web. P. C. 29 (Common Pleas 1785).*

monopoly. The function of the patent grant was therefore changing. Whereas previously it was seen as an object of patronage, by the end of the 1700s we begin to see it being discussed in connection with the promotion of invention.

So, finally, more than 200 years after the inception of a discrete policy of monopoly grant for new manufacture, description of the subject matter had come to be required at law. The hiatus that followed the enactment of the *Statute of Monopolies* had been broken and the courts of the common law had asserted their place as the sole arbiter of the system of monopoly grant.

The foregoing discussion highlights some of the problems that the patent system has experienced during its long history. In addition, consideration of the Elizabethan practice has enabled us to begin to form a picture of the rationale for the grant. The clear motivation behind the early system was the improvement of the Realm. Considerations of the 'price' that the patentee should pay for the grant only really became important when the object shifted from instituting new manufacture to protecting invention in a modern sense of the word. As technology progressed, the problems associated with the scope of the grant became more visible. This predicament was compounded by the simple fact that the number of grants also increased. When there were only 50 patents extant in the country it was relatively simple to decide issues of infringement, however, as the custom evolved the numbers grew.

The problem of 'odious' monopoly is also significant for, as we have seen in Chapter I, the traditional view of the courts in the UK is that the patent is an exception to the principle of free trade. This view shares its roots with the *Statute of Monopolies* itself, and it is interesting to note the same arguments being raised against wide protection today as were levelled at the abuses of Elizabethan policy. Seen within the historical context, the introduction to the economics of the patent system in Chapter III reveals more than a simple dry treatment of the subject would do.

The move away from viewing the patent as an instrument of Crown policy to a legal right obtained by an inventor is consonant with the tightening hold of the common law over the system. This is reflected in the grant's change of focus from the issuing body

to the petitioner. Therefore we see the patentees in the period post-Nasmith taking a more active role in the definition of their own scope of protection.

The separation of the Crown from the grant is also significant as it enabled opponents of the system to begin to voice their complaints, and competitors to challenge the grants, without this being viewed as criticism of the Sovereign However, this did little to address the general feeling of discontent that surrounded system. Patents still maintained their association with 'odious' monopoly in the mind of the people, but the system was gaining in popularity. Thus, the 22 patents granted in the first decade of the 18th century had become 647 in the last.[189] Moreover, the growing competitiveness of patenting and the oft-hostile attitude of the courts 'generated a new concern for reform among patentees themselves'.[190] In addition, this period in history saw the birth and popularisation of the political economists such as Smith, Bentham and Mill. Their comments and theories allowed the patent grant to be considered in a new light in their revolutionary 'Market Economy'.

[189] MacLeod, *Industrial Revolution*, *op cit.*, at 150.

[190] *Ibid.* at 182.

CHAPTER III

Patents Within the Market Economy

Part One
–
Classical Economics
&
Philosophy

Preface

In this Chapter, we consider the administrative and legislative changes to the patent system that occurred in, and around, the 'Anti-Patent' debate of the late 19th century. The philosophical arguments, both for and against the system, which appeared in the popular press and the infantile arena of the political economists illustrates the early rationalisation of the grant. This revelation of policy not only provides a backdrop to the modern theories, discussed in Chapter V below, but also allows us to see the manner in which economic theory began to be utilised in an attempt to both explain and justify the system with varying degrees of success. In addition, our discussion explores the effect on public perception at this time of the shadow of monopoly that had dogged the grant since Elizabeth the First's reign, and still habitually raises its head today.

This Chapter explores popular misgivings over the patent system and assesses their impact. The fact that an 'Anti-Patent' debate could rage so furiously, and publicly, in the late 19th century is testament, in itself, to the depth of bad feelings and the importance of the issues at stake. This experience demonstrates more clearly than any other that the publics' perception matters. It is not simply sufficient for a legal regime to be fair if it is not also seen to be fair; and the patent system in evidence in late Victorian Britain was ostensibly neither. However, despite damning criticism, the core survived and important legislative and administrative changes were undertaken to assuage the popular discontent. The patenting process and the quality of the grant were greatly improved, and crucially, the claims and the specification assumed what is now considered to be their proper place at the centre of the patent.

However, this is not all that the Victorian controversy did for the system, for, as we shall see, it also galvanised economic debate on the justifications of the patent grant. As a consequence, the philosophies of Bentham, Mill and Smith were revitalised and re-energised, in turn enabling an economic agenda to begin to replace the ostensibly pragmatic justifications of the past. It is important to note that these early, 'classical' theories not only form the basis of much modern economic thought on the patent system, but also are regularly advanced as justifications in their own right.

However, before discussing the early economic theory in any depth, we begin with general comments on the economic appreciation of the patent grant. In addition, we consider the nature of the rights that the patent provides and explore some of the problems that are associated with the creation of property in the intangible.

Introduction

As we have seen, the patent system grew from seeds buried within the royal prerogative, its roots stretching back through the *Statute of Monopolies* and Elizabethan grants as far as the City State of Venice and beyond. Patents are not a new invention, and yet considered economic appreciation and analysis of them is a relatively modern concept. The treatment of the patent system by writers such as Mill, Bentham and Smith is discussed below, and shall not be pre-empted here, suffice to say that their handling was brief, mere paragraphs in treatises many hundreds of pages long.[1] This is not a criticism of their approach, merely testament to the way in which patents were perceived at this point in time; they were taken for granted, like them or not, and little thought was directed to their justification as tools of commerce.

One of the most noteworthy features of the patent system that is evident throughout its history is the knack that it displays for passing relatively unscathed amidst an avalanche of criticism. Abuses rush to the fore, condemnation is piled high, but the core of the system remains intact and slinks away to fight again. It is telling to note that Fox, writing in 1947, stated when discussing patents for invention that "there has never been, until the present time, any criticism of this type of exclusive privilege. It was always recognised at common law as a proper subject for a prerogative grant, and the Statute of Monopolies made no change in this conception."[2] As we shall see, this statement completely ignores wholesale condemnation that rained down upon the patent system the mid-19th century: how easily such a public debate was forgotten! Fox's comments, however inaccurate, are testament to the fact that patents simply *exist* within the societal

---

[1] Mill, *Principles of Political Economy* (1929; Longmans, Green & Co., London; 2nd Ed.), mentions monopolies in connection with patents only once (at 932). Smith, *The Wealth of Nations* (1937; The Modern Library, New York) similarly only extends discussion of the topic of monopoly to patents on one occasion (at 712). However, it should be noted that Smith accords patents significantly more explicit coverage in his *Selected Essays on Jurisprudence*, (1978; Clarendon Press, Oxford) (Meek, Raphael & Stein (eds.)), at 83 and 472. Bentham, of all of the early political economists, devotes the most time to discussing the expediency of granting monopoly privilege for inventions, but even his treatment is limited to a mere handful of pages in an extensive text. See Bentham, *Manual of Political Economy*, Part II – Proper Measures, ch 19. In Stark, ed., *Jeremy Bentham's Economic Writings*, (1952; George Allen & Unwin, London), Volume I, at 260-65.

[2] Fox, *Monopolies and Patents: A Study of the History and Future of the Patent Monopoly*, (1947; University of Toronto Press, Toronto) at 178-9.

mind, they are like the air, gravity or even invention itself; society takes them for granted. Just as Mill, Bentham and Smith never once questioned the provision of temporary monopoly as a reward to the inventor and, in the same vein, patents for invention escaped the wrath of the *Statute of Monopolies*, so did they until relatively recently evade the rigors of economic analysis.

An Economic Analysis of the Patent System – Hiatus

Despite a noisy attack launched by 'free-traders' in the mid-19th century and subsequent reforms of the patent system, discussions of patents largely avoided any in-depth economic analysis until the first half of the 20th century. The consequences of monopolistic distortion of the market economy were well known, clearly illustrated by events of the late Tudor/early Stuart period leading to *Statute of Monopolies*.[3] Therefore, it is hardly surprising that economists first concentrated their attention on abuses of monopoly power rather than seeking, shaping or upholding justifications for the grant of temporary monopoly in the case of new manufactures. This much is clear from the works of Mill and Smith, who, despite long diatribes on the evils of monopoly, were content to state that such bad blood did not extend to the provision of exclusive privileges for a limited time to the originator of an improved process.[4] Indeed, until relatively recently "economic analysis of law was almost synonymous with economic analysis of antitrust law".[5] Up to this point economists seemed to be content to leave discussion of the exact scope of the patent right to the Courts while they analysed business practices.[6]

Before proceeding to consider the economics of patent scope in detail, it is considered beneficial to step back for one moment and to address some general economic philosophical and practical issues that underlie the more complex analysis. This discussion begins with consideration of the patent as an item of property.

---

[3] See Chapter II, above.

[4] See Mill, *op cit.* at 932, and Smith, *op cit.* at 712.

[5] Posner, *Economic Analysis of Law* (1992; Little, Brown and Company, Boston; 4th Ed) at 21. Antitrust law is basically law forbidding all combinations in restraint of trade and primarily focuses on business practices and abuses of monopoly power rather than looking at justifications of the patent system.

[6] The foregoing is not to say that antitrust arguments have no relevance to the patent of invention, however, an in-depth analysis of the abuses of monopoly power that would fall within the sphere of antitrust is outside of the scope of this work.

Property and Patents

It is now universally accepted that the patent right, as other categories of intangible rights falling under the umbrella of 'Intellectual Property', creates a form of personal property. This fundamental assertion is enshrined in statute by virtue of s.30 of the Patents Act 1977. However, this has not always been the case. Indeed, it is only recently that the patent has come to be appreciated as an entity distinct from an instrument of Crown privilege. During the 'Anti-Patent' debate of the late 19th century, for example, many proponents of the system were apt to refer to 'property in inventions' (as opposed to property conferred by the patent right). Whilst it is now accepted that the patent grant can create property rights, "the idea of property in an invention is not taken seriously by modern economists."[7] Therefore, in order that the nature and problems of the patent 'monopoly' be better understood it is helpful to reflect upon its transition from prerogative to administrative grant. The following discussion is, however, limited to consideration of the patent grant within the traditional property sphere. Constraints of time and space render in-depth discussion of general theories of property rights outside of the scope of this work.[8]

The Patent Grant: Transition

The patent for invention began as an object of Crown favour; a monopoly privilege dispensed by application of the royal prerogative. A complicated history littered with abuses led to it being tainted with the stain of 'odious monopoly'.[9] Focus on the nature of the grant (as an instrument of Crown policy) necessarily restricted realisation of the

---

[7] See Machlup, *An Economic Review of the Patent System*, Study No. 15 of the Sub-Committee on Patents, Trademarks and Copyrights of the Committee on the Judiciary, U.S. Senate 85th Congress, 2nd Session, (1958; Washington) (hereinafter Machlup) at 26.

[8] However, those interested in general discussion of the 'Rise and Decline of Property' are directed to; Nozick, *Anarchy State & Utopia*, (1974, Blackwells, Oxford); Waldron, *The Right to Private Property*, (1988; Clarendon, Oxford); Demsetz, *Toward a Theory of Property Rights*, *(1967) 57 American Economic Review 347*; also Armstrong, *From the Fetishism of Commodities to the Regulated Market: The Rise and Decline of Property*, *(1987) 82 Northwestern University Law Review 79* and the references given therein, specifically Grey, *The Disintegration of Property*, in Pennock (Ed.), *Property*, (1980; New York University Press, New York); Donahue, *The Future Concept of Property Predicted from its Past*, in Pennock, *idem*; and Massey, *Justice Rehnquist's Theory of Property*, *(1984) 93 Yale Law Journal 541*. Also see Oakes, *"Property Rights" in Constitutional Analysis Today*, *(1981) 56 Washington Law Review 583*; and Honore, *Ownership*, in Oxford Essays in Jurisprudence, 107 *et seq.* (1961; Oxford University Press, London) (A. Guest (Ed.)).

[9] See text accompanying note 67 *et seq.* in Chapter II, above.

patent within this context, as it was seen as a *de facto* brother of monopoly if not monopoly itself. This, in turn, hindered its acceptance as an item of property and its realisation as a separate category in the embryonic sphere of what is now known as Intellectual Property Law. Therefore, whilst arguments that a property right existed in the patent grant were being advanced as early as the beginning of the 18th century,[10] it was not until the reforms of the mid-19th century that the grant of a patent could finally be seen as such.

The close association that the patent system maintained with the Crown until the late 19th century was, in itself, a major stumbling block to reform. It hampered any thought of improving the system as this "would have exploded the ancient theory that a patent is a special direct grant from the Crown of certain valuable privileges, and that it is only by Her Majesty's gracious favour that these privileges are granted at all."[11] It is therefore unsurprising that it took a near-fatal bombardment of the system by 'abolitionists' in the 'Anti-Patent' debate to force the administrative and legislative wheels into motion.[12] Once the debate had been settled, and public argument had established that the patent custom was essentially valid yet in dire need of reform, public faith in the *idea* of a patent system was able to grow. Such faith was vital to the transition from instrument of the Crown to self-contained entity, as it enabled legal reform to become a serious possibility. At the same time, bureaucratic failings of the Patent Registry provided additional cause for complaint and added pressure for administrative reform of the system.

Uncertainty over the requirements for (and exact nature of) the specification, coupled with widespread ignorance of the state of the law, had lead to a perception that patents

---

[10] See MacLeod, *Inventing the Industrial Revolution: The English Patent System 1660 - 1800*, (hereinafter MacLeod, *Industrial Revolution*) (1988; Cambridge University Press, Cambridge) at 198 for a discussion of such early rationalisation of property.

[11] H. Truman Wood, *The Patents for Inventions Bill 1877*, *(1877) 25 Journal of the Society of the Arts 342*. Quoted from Bently & Sherman, *The Making of Modern Intellectual Property Law* (1999; Cambridge University Press, Cambridge) (hereinafter Bently & Sherman) at 131.

[12] It should be noted that neither side in the debate was in favour of preserving the *status quo*, the argument was between those advocating reform and those in favour of abolition.

granted at this time were practically worthless.[13] An inefficient filing and granting system and petty disputes over who, patent attorneys or lawyers, had the standing to act as agents for inventors for the purpose of obtaining patents, had corrupted public perception of the system even further. Thus, a catalogue of reforms was introduced to pull the system back from the shifting sands of bureaucratic inefficiency onto firmer ground. These included the institution of indexes of granted patents arranged both chronologically and alphabetically;[14] the various offices, once scattered around the city of London were moved into one building; and the post of examiner was placed onto sounder footings by the institution of job specifications and clarification of pension arrangements.[15] However, the reform that had most impact on the promotion of the patent as property (as opposed to privilege) was the introduction of a system of registration by the 1851 Protection of Inventions Act.

Originally introduced as a temporary measure in connection with the Great Exhibition (therefore consonant with a public event supported by the Queen and considered not threatening to the role of the Crown in matters patent), it proved a sweeping success and paved the way for more concrete legislative reforms. Therefore, in the 1852 Patent Law Amendment Act, Parliament was able to introduce a more effective system of registration whereby property arose in the invention from the date of *application* rather than *grant* by the Crown. This change was of vital importance in the patent's evolution as an item of property as it created *bureaucratic* property in the grant enabling its emergence from the shadow of the prerogative.[16] However, this change in the administration of the patent system initially did little to quell the widespread distaste for patents.[17] Indeed, problems with the registration system, combined with the continuing

---

[13] See Bently & Sherman, *op cit.* at 131, who draw this conclusion from the speech of Lord Wolverton (17th November, 1902) 114 *Hansard* cols. 1099 ff.

[14] As opposed to the purely chronological indexes of the past.

[15] All administrative rather than strictly legal reforms. See Bently & Sherman, *op cit.* at 132-3.

[16] See Webster's answer to Q.544 in *Report of the Select Committee on Letters Patent*, House of Commons Papers 1871 (Command Paper Nº 368). Also Bently & Sherman, *op cit.* at 134.

[17] *The Economist* reported on 5th June 1869 (some 18 years after the initial reform) that "it is probable that patent laws will be abolished ere long. There is universal agreement that no patent law should cover all the inventions which are now covered. It is for the general interest that patent laws should be abolished."

uncertainty of the nature of the patent specification, added fuel to the abolitionists' fire.[18]

The following discourse is therefore limited to consideration of the modern patent of invention as an item of property, specifically the problems that this raises in respect of the philosophical aims and justifications of the scope of patent protection. During the ensuing discussion recourse will be had to arguments and theories posited during the pre-modern era of patent law, however, the author is at pains to point out that these references will only be made where they can be realistically carried into a contemporary frame of reference.

The Problems of Patents as Property

The acceptance of the patent as an item of property is not something to which most of those using the system will ever direct their thoughts. Statute dictates that patents are to be treated as personal property for the purposes of assignment, mortgage, transfer upon death, etc. Therefore patents *are* property. However, certain aspects of 'Intellectual Property' in general, and patents in particular, render such a simple conclusion lacking in substance, especially when the boundaries of this 'property' come to be considered.

The principal problem involved with viewing the patent as an item of property is also one of its defining features: intangibility. As with any other proprietary right the patent is capable of being trespassed upon; the rights of the owner can be infringed by the commercial operation of another in the State(s) in which protection has been obtained.[19] However, the fundamental difference between trespass upon the rights of the owner of tangible property and the rights of the patentee is a factor of its intangibility. Before matters of infringement can be concluded, the property itself, the extent of the right, the boundaries of protection, must be decided upon. Herein lies our problem.

---

[18] See further Boehm, *The British Patent System: I Administration*, (1967, Cambridge University Press, Cambridge) who states that "The 1860's and 1870's were also the period in which the patent system sustained its severest opposition." at 29.

[19] It is important to remember that the patent is essentially creature of territory, its power curtailed by the territorial limits of Sovereignty. Therefore a patent granted in the UK is only effective within the UK, however wider protection can be obtained by the acquisition of multiple patents in other States.

The abstract nature of this monopoly makes the application of a traditional legal analysis of property rights difficult, if not impossible. In cases of theft or trespass concerning tangible property there is rarely, if ever, the need to enter into complex debate about the boundaries of the property concerned. It may be that the rights affected need some clarification, but in general if someone strays onto your land or appropriates an item of personal property you can see his or her presence. Boundaries are clear.

This is not the case with patents. Therefore, it is pertinent to inquire how their existence as items of property can be justified, and indeed how the legal treatment of patents can be intellectually separated from the treatment of other forms of 'Intellectual Property' such as copyright or designs. Such an examination is rendered more pertinent when determination of the scope of the patent right is taken into account.

The problem with a patent arises because of the way in which the scope of protection is defined. A patent may be said to provide protection to the 'inventive idea' or 'subject matter' that lies behind an invention. This is quite often wider than the projection or expression of the idea in real space and, given its abstract nature, the only sensible way in which this 'matter' can be contained is to pin it down in a net of words. The accepted, indeed required, method of doing this is to write a series of claims, backed up by drawings and a more verbose and descriptive specification detailing the background of the invention, the problems that the inventor faced and the steps they took to overcome them, and generally explaining things to one versed in the art.[20] However, this is not the end of the matter, claims are used to define the invention but great care must be taken not to make the definition too wide so as to encompass something that is not new.[21] To claim as subject matter that which is already known would be to monopolise part of the public domain, a fundamental evil. Therefore it is the job of the claim drafter to effectively enclose the invention without straying into the prior art and

[20] See s.14 Patents Act 1977.

[21] On the issue of overly broad patent claims see, for example, *Biogen v Medeva*, [1997] RPC 1, where the House of Lords held that the requirement that the claims be supported by the description means that overly broad claims can be objected to on the basis that the disclosure is not adequate – thereby importing s.14(5) into s.72(1)(c).

without overly stretching the claim to encompass things that the inventor has not actually invented, or not described.

Thus stated, it is clear that there are two main questions that need to be answered in respect of the philosophical and legal justifications of patents for invention. First, and most fundamentally, how is the grant of a bundle of property rights in the intangible justifiable, i.e. on what basis does society rationalise the award of a temporary monopoly to the inventor for her invention? Second and inextricably linked with the first question, how large a bundle of rights should the inventor receive, i.e. how broad should the monopoly granted actually be? In answering the latter of these questions regard must be had to the extent to which the philosophical justifications of the patent system permit expansion from the literal scope of the claims. This, in turn, opens the debate to include a consideration of the factors that affect the intrinsic scope of the patent as drafted (i.e. the reasons why the patent is drafted with the breadth that it is), a point that relays us back to the justifications of the patent system. Armed with this information, it will then be possible to critically appraise the economics of the patent system and compare philosophical and economic conclusions on the desired breadth of patent protection. However, before we consider the justifications of property in the intangible it is necessary to examine two more facets of the nature of the property that forms the subject of the patent grant, non-excludability and non-exhaustibility.

Free goods and public goods

We have already noted the potential conceptual difficulties associated with the recognition of the intangible as property, no more need be said on this matter, however, consequences of the nebulous nature of the property right pervade throughout any economic discussion. The patent system creates property in invention by facilitating and imposing control of the knowledge that defines the invention, therefore enabling limitations to be placed on its supply and use. The patent system creates the idea of property in an invention. As such, it cannot be justified on the basis that invention is property, as without the patent system property in an invention does not exist. The invention is property because of the patent system, because this imposes a structure of scarcity.

Patents concern knowledge. They protect the ideas behind an invention as reduced to practice. Knowledge is unlike physical property in that it cannot be exhausted by use.

It is known as a 'free good'. Thus an invention, once it has been made (the concept plucked from the ether and reduced to practice) "can be regarded as a non-wasting asset whose use involves no additional economic cost, beyond costs of communication and learning."[22]

Thus, the social value of an invention is not lessened by its widespread use. Indeed, it can be convincingly argued that the attendant benefit of use increases its value, as society is able to enjoy the invention more fully. In short, it is wasteful to *restrict* its use. Considered in this light it is a small step to state that where an invention results from a spontaneous flash of insight, and therefore has no attendant cost of creation, it should ideally command a zero price in order that its benefit be maximised. However, such a bold statement ignores the costly reality of invention and innovation. Whilst it may be true that the original inventive idea could be costless, it is seldom the case that it is so simple and brilliant that it can be perfected or brought to the market without financial burden. Moreover, in the research-intensive society in which we live, the costs associated with the 'creation' of an invention may, without some form of compensation or incentive, be proscriptively high.

However, as Taylor & Silberston state "[t]he real difficulty arises because many inventions, like other types of knowledge, are not simply 'free' goods: they are to a large extent 'public' goods as well."[23] That is to say, as well as their non-exhaustibility, many inventions also suffer from non-excludability, so that once they are made available to one, they are (absent legal protection) made available to all. Put another way, once implemented, or otherwise disclosed they can be freely, and relatively costlessly, copied by others.

Consequently, because of non-excludability and non-exhaustibility (sometimes termed non-rivalness) there can be no market for a public good. In the absence of some sort of protection once an invention has been created it is freely appropriable and therefore of strictly limited worth to its creator. It is, of course, worth an amount commensurate

---

[22] See Taylor & Silberston, *The Economic Impact of the Patent System*, (1973; Cambridge University Press, Cambridge) at 24; Quoting from Arrow, *Welfare Economics and Inventive Activity*, in the Rate and Direction of Inventive Activity, (1962; NBER, Princeton).

[23] *ibid.* at 25

with the market value of the invention. However, if costlessly copied, this value is simply equal to the production cost, as competition will push the price down.[24] The invention itself cannot be sold, as it is freely appropriable by all. Therefore, in the absence of some sort of proprietary right there is likely to be a disincentive to invest in invention, as competition will make it impossible to recover sunken research and developmental costs.

With these points in mind, we now turn to address the issue of justifying the creation of property in the intangible.

Classical Justifications of Property in the Intangible – The Patent

During the 'Literary Property' and 'Anti-Patent' debates that raged consecutively from the mid-18th to the latter half of the 19th centuries, a great deal of thought was directed towards the justification and distinction, or isolation, of property rights in the intangible. It is therefore unsurprising that this period marks an oasis for economic analysis of the patent system in a desert otherwise relatively featureless until the 1920s.

Broadly four lines of reasoning in general circulation in the mid-19th century can be identified. These arguments form the basis of modern criticism of the patent system and are still utilised by lawyers, economists and the courts today. Each category found its own supporters and opponents within the debate and each can be argued, to some extent, to form a basis for the patent grant. As ever, certain theories find more favour than others do with contemporary critical thinkers and, as we shall see, different justifications suggest different scope for the patent rights. It is obvious to say that no *one* theory can attempt to provide a complete explanation of the system, however, the reader is asked to bear this in mind when considering the remainder of this Chapter. It is not the author's intention, nor would it be possible, to provide *the* definitive justification for the patent grant, however, insight into these 'Classical' arguments is considered a valuable diversion before the modern economic theory *per se* is discussed.

Each broad theory is dealt with in turn before considering the implications that they have for the determination of patent scope. Any attempt to critically evaluate the philosophical integrity of the various theories is outside of the scope of this work.

[24] See further text accompanying note 3 in Chapter V, below.

Therefore, apart from drawing the reader's attention to popular criticisms of the various justifications, the author makes no attempt to 'prove' or 'disprove' any of the assumptions upon which these theses rely. Various academic writers including Dutton[25], Walterscheid[26], Coulter[27] and Machlup & Penrose[28] have covered these four heads of reasoning in some detail. The following discussion is to a large extent based upon their work.[29]

The 'Natural Right' Theory

The 'natural law' thesis is a moral justification based upon the assertion that the individual has a natural property right in their ideas. By extension, therefore, they also have a natural right to the sole exploitation of these machinations such that unauthorised use by others without compensation must be condemned as theft. This property is exclusive and personal, and therefore society (and thus the State) is under a moral obligation to recognise and protect these rights. What, in the words of J.R. McCulloch, is more apt to be "called a man's exclusive property ... [than] that which owes it's birth entirely to combinations formed in his own mind, and which, but for his ingenuity, would not have existed"?[30]

The thesis found firm footing in the French patent law of 1791, the preamble to which states:

> "[T]hat every novel idea whose realization or development can become useful to society belongs primarily to him who conceived it, and that it would be a violation

---

[25] Dutton, *The Patent System and Inventive Activity During the Industrial Revolution 1750-1852*, (1984; Manchester University Press, Manchester), (hereinafter Dutton), at 17-29.

[26] Walterscheid, *The Early Evolution of the United States Patent Law: Antecedents (Part 4)*, (1996) 78 JPTOS 77 (hereinafter Walterscheid, *Antecedents IV*) at 104-106.

[27] Coulter, *Property in Ideas: The Patent Question in Mid-Victorian Britain*, (1991; Thomas Jefferson University Press, Kirksville) (hereinafter Coulter), particularly ch.3.

[28] Machlup & Penrose, *The Patent Controversy in the Nineteenth Century*, (1950) 10 J Ec. Hist. 1 (hereinafter Machlup & Penrose) at 10-26. See also Machlup, *op cit.* at 19-44.

[29] Machlup, *op cit.* when discussing these points states at 22 "...These references serve only as samples, since in most instances many writers have made the same points. Indeed, if one always cites only the "first and true inventor" of an argument concerning the patent system, one will rarely be able to cite an author of the 20th century."

[30] Scotsman, 26th May 1826; J.R. McCulloch, *Commercial Dictionary*, 1832 at 817-8; Quoted from Dutton, *op cit.* at 18.

> of the rights of man in their very essence if an industrial invention were not regarded as the property of its creator."[31]

This approach accords to a Lockean labour theory analysis of property rights, whereby labour functions as a determinant of title.[32] Locke's core propositions have been summarised as follows:

1. God has given the world to people in common.
2. Every person has a property right in his own person.
3. A person's labour belongs to him.
4. Whenever a person mixes his labour with something in the commons he thereby makes it his own property.
5. The right of property is conditional upon a person leaving in the commons enough and as good for the other commoners.
6. A person cannot take more out of the commons than they can use to advantage.[33]

Therefore, when applied to the intellectual labours of invention, it is possible to argue that the inventor should have a 'natural right' in their creation. At the time that Locke was writing it is improbable that he entertained the notion of property in the intangible, his philosophical musings being more likely directed to the explanation of corporeal ownership. However, this did not prevent some proponents of the patent system in the 19th century liberally applying his theories and concluding that "permanent and inalienable" property rights existed in ideas.[34] One such legal writer was Turner, barrister and author of a number of treatises on patent law, who justified the system on

---

[31] Preamble to the French Patent Law of 1791 quoted from Machlup, *op cit.* at 22.

[32] See further John Locke, *Two Treatises of Government*, (1993; M.Goldie, ed.; Everyman, London; Original published 1690) Chapter V, Book II. For a modern exploration of the philosophy of intellectual property, which includes discussion of Locke's theories, see Drahos, *A Philosophy of Intellectual Property*, (1996; Dartmouth, Aldershot (UK)) (hereinafter Drahos).

[33] Taken from Drahos, *ibid.* at 43.

[34] Jobard, *Nouvelle économie sociale ou monautopole industriel, artistique, commercial et littéraire* (1844; Paris) at 5, 130, 239 *et seq.* Quoted from Machlup, *op cit.* at 22.

the basis that it was "simply the application of the natural principle of property as the reward of labour."[35]

It is, however, a theory largely shunned by British and American historians, lawyers and economists as having played no part in the evolution of a modern Anglo-American law of patents.[36] This stance shares strong contemporary support, the Westminster Review, for example, lambasted the idea by stating "to talk of natural rights of an inventor is to talk nonsense."[37] Further, it was argued that to allege theft of an idea is for a man to complain "that something has been stolen which he still possesses, and he wants something back which, if given to him a thousand times, would add nothing to his possession."[38] Webster neatly summed up contemporary opinion when he stated that "[t]hose who believe the inventor to have a natural right ... must have an entire misconception as to what it is the inventor really achieves."[39]

The main criticisms of 'natural rights' as justification for the patent system stem from an analysis of the substance of the property concerned and the actuality of the system as it stood when the arguments were first advanced.[40] Thus, if property in ideas is a natural right there is little logical basis for that right to be limited to a term of years, rather it should be perpetual. In addition, it does not sit comfortably with either the concept of knowledge as a non-exhaustible commodity,[41] nor with any criteria of patentability that the inventor must satisfy before a patent is granted. Further, it suggests that the scope of the right awarded should be tied to the actual effort, or degree of labour, exercised in creating the invention, with more time equating to greater protection. This would not only relegate flashes of inventive genius to receive little, if any protection, but would

---

[35] Turner, *Counsel to Inventors of Improvements in the Useful Arts*, (1850; F. Elsworth, London) at 50; Also Coulter, *op cit.* at 80.

[36] See comments to this effect in Dutton, *op cit.* at 18; MacLeod, *Industrial Revolution*, *op cit.* at 197; Walterscheid, *The Early Evolution of the United States Patent Law: Antecedents (Part 1)*, (1994) 76 JPTOS 697 (hereinafter Walterscheid, *Antecedents I*) at 715.

[37] *The Patent Laws*, (1829) XXVI Westminster Review 329.

[38] Hermann Rentzsch, *Geistiges Eigenthum*, Handwörterbuch der Volkswirtschaft (1866; Leipzig) at 334; Quoted from Machlup, *op cit.* at 22.

[39] Webster, *Law and Practice of Letters Patent for Invention*, (1841; London), at 3; Quoted from Dutton, *op cit.* at 18.

[40] And still stands today.

[41] One whose stock is not depleted by use. See text accompanying note 22, *et seq.*, above.

also tend to favour complicated, expensive and time-consuming invention over elegant solutions to problems.[42] Moreover, the Lockean approach would not justify the provision of an exclusive monopoly where both copying and independent creation are similarly prohibited.

It is therefore unsurprising that this theory finds little support in modern literature.[43] Indeed, Machlup notes that it is "interesting to note that some French lawyers[44] conceded that they preferred to speak of 'natural property rights' chiefly for propaganda purposes, especially because alternative concepts, such as 'monopoly right' or 'privilege', were so unpopular".[45] Therefore, we move to our next possible philosophical justification for the patent system, the reward by monopoly thesis.

The 'Reward by Monopoly' Theory

By contrast to the 'natural right' theory, the 'reward theory' found strong support with English economists during the 'Anti-Patent' debate. It calls for protection in the name of fairness to secure the inventor their just reward, proportional to the usefulness of the invention to society. As this reward cannot be guaranteed by reliance upon ordinary market forces, State intervention is justified in the provision of temporary monopoly.

Smith, Mill and Bentham can all find support for the provision of the patent monopoly under this banner. Smith noted that optimum economic conditions are often not those found under natural, unregulated trade. He saw the law and the lawmaker as vitally important players in ensuring that competition was maintained and resources efficiently allocated. His support for the patent system therefore rests on two main points. First, that the provision of temporary monopoly was "the easiest and most natural way in

---

[42] Promoting so-called 'cargo-cult science'. See Feynman, *Surely You're Joking Mr. Feynman* (1992; Vintage, London).

[43] The support that it does find is limited (as far as this author can discern) to one article (Mossoff, *Rethinking the Development of Patents: An Intellectual History 1550–1800*; (2001) 52 Hastings Law Journal 1255), which stresses the Lockean conception of 'social contract'. An argument more in line with the 'exchange for secrets' theory than a strict interpretation of the natural rights thesis.

[44] From whom we find most of the support for such a notion of natural rights in ideas.

[45] Machlup, *op cit.* at 23. Machlup names DeBouffler, reporting the Patent Bill to the French Constitutional Assembly in May 1791, quoted by Augustin-Charles Renouard, *Traité des Brevets D'invention*

which the state can [provide] recompense ... for hazarding a dangerous and expensive experiment, of which the public is afterwards to reap the benefit."[46] Further, "if the legislature should appoint pecuniary rewards for the inventors of new machines, etc., they would hardly ever be so precisely proportiond (*sic*) to the merit of the invention as ... [the patent monopoly] is."[47] Second, that the grant of such a monopoly was harmless to society as "if the invention be good and as such is profitable to mankind, [the inventor] ... will probably make a fortune by it; but if it be of no value he also will reap no benefit." He continues, talking also of copyright, "[t]hese two privileges therefore, as they can do no harm and may do some good, are not to be altogether condemned. But there are few so harmless."[48] Therefore, despite long diatribe on the evils of monopoly, Smith was prepared to accept that the patent grant was not only a necessary, but also an economically justifiable, means to an end.

Mill, equally forthright in his support for rewarding invention by grant of a temporary monopoly, states in his *Principles of Political Economy*: "That ... [the inventor] ought to be both compensated and rewarded ... will not be denied ... it would be a gross immorality in the law to set everybody free to use a person's work without his consent, and without giving him an equivalent."[49] He also notes that pecuniary grants have, in some cases, been made to the inventor, but considers that "in general an exclusive privilege, of temporary duration is preferable; because it leaves nothing to any one's discretion; because the reward conferred by it depends on the invention's being found useful, and the greater the usefulness, the greater the reward; and because it is paid by the very persons to whom the service is rendered, the consumers of the commodity." Therefore, whilst recognising that "the present Patent Laws [i.e. those of the early-to-

---

(Paris; 3rd Ed, 1865) at 103. Also, Vicomte Dubouchage in the debate on the new French Patent Law, Chambre des Pairs, séance du 24 Mars, 1842. Le Moniteur Universel, Nº. 84, March 25, 1843, at 542.

[46] Smith, *The Wealth of Nations, op cit.* at 712 – at this point Smith is actually talking about grants of temporary monopolies to joint stock companies, but continues "A temporary monopoly of this kind may be vindicated upon the same principles upon which a like monopoly of a new machine is granted to its inventor..."

[47] Smith, *Lectures on Jurisprudence, op cit.* at 83.

[48] *Ibid.*

[49] Mill, *Principles of Political Economy, op cit.* at 932-3.

mid-19th century] need much improvement"[50], Mill was eminently satisfied of their conceptual legitimacy as just reward within the free market economy.

Bentham adopts similar reasoning to justify patents on the basis of reward.[51] He divides labour into two distinct subcategories: The first being the bodily energy employed in the production of an effect; and the second, the skill or mental power displayed in the exercise of the bodily act. "Mere labour, exclusive of skill, cannot be copied without equal labour... skill, on the other hand, ... is ... capable of being indefinitely imbibed and diffused ... without any exertion of mental labour comparable to that ... [by] which it was acquired... A man will not be at the expence *(sic)* and trouble of bringing to maturity an invention unless he has had a prospect of an adequate satisfaction."[52] He then considers the various guises that this satisfaction may take: *Viz.*; reputation, the possibility that the invention may be reliably kept secret, and the provision of some kind of pecuniary reward. However, he concludes that none of these are possible in all situations. Preferable, therefore, is the provision of temporary monopoly so that "all persons but the author of an invention [are] excluded for a certain time from the liberty of practising it".[53] As, "[a] patent considered as a recompense for the encrease *(sic)* given to the general stock of wealth by an invention, as a recompense for industry and genius and ingenuity, is proportionate and essentially just. No other mode of recompense can merit either one or the other epithet."[54]

Arguments based on the reward theory embodying the ideas of Smith, Mill and Bentham became stock-in-trade for virtually every writer on the subject by the late 1850s.[55] However, as Dutton notes, for the "classical economists patents were not a burning issue,"[56] therefore we see only modest treatment of the system in the contemporary texts. Indeed, the Political Economy Club, formed in 1821, which often discussed "major contemporary issues, did not debate patents until late 1854."[57]

---

[50] *Ibid.* at 933.

[51] See Bentham, *Manual of Political Economy*, *op cit.* at 260-65.

[52] *Ibid.* at 260-1.

[53] *Ibid.* at 263.

[54] *Ibid.*

[55] See Dutton, *op cit.* at 20; Machlup, *op cit.* at 23; and Machlup & Penrose, *op cit.* at 21.

[56] Dutton, *op cit.* at 20.

[57] *Ibid.* at 30-1.

However, this 'settled' view, that the inventor deserved reward and that the patent system was the most economical method of providing it, was not without criticism: "Geniuses, just as stars, must shine without pay," was a Swiss comment on this point.[58] Further, the moral argument that inventors deserved to be rewarded for their contributions to the progression of human knowledge did not go unquestioned. One popular, and forceful, criticism of patent 'rewards' found its basis in the 'social origin theory' of invention. Thus, Machlup & Penrose quote Ricardo as insisting that "nearly all useful inventions depend less on any individual than on the progress of society" and that therefore there is no need to "reward him who might be lucky enough to be the first to hit on the thing required."[59] This criticism is also arguably in line with Kitch's prospect theory of the patent system, discussed below,[60] which effectively analogises the patent system and the mineral claim system, suggesting that inventions are somehow 'waiting to be found'.

Other critics did not deny that the inventor had a *moral* right to be rewarded for their efforts, but stated that this reward would flow naturally, without the need for legal intervention. Thus Schäffle, whilst supporting the provision of temporary monopoly for the protection of literary property, denied the need for the same in respect of inventions. He reasoned that the head start that the first user of an invention gained within the market would, as a general rule, provide sufficient reward for the inventor. This was, however, not the case in the book publishing business, where the speed with which pirated editions could enter circulation rendered 'lead time' insufficient reward in

---

[58] Taken from Machlup & Penrose, *op cit.* at 17. They state that this quotation was "[c]ited disapprovingly by Wilhelm Roscher, *System der Volkswirtschaft* (1881; "Nationalökonomik des Handels und Gewerbefleisses", Stuttgart), Volume III, at 758."

[59] See Machlup & Penrose, *op cit.* at 18, also see Machlup, *op cit.* at 23; John Lewis Ricardo MP, in the hearings of the Select Committee of the House of Lords; reported by *The Economist* (London), July 26, 1851.

[60] See text accompanying note 72 *et seq.* in Chapter V, below. Also Kitch, *The Nature and Function of the Patent System, (1977) 20 Journal of Law & Economics 265.*

itself.[61] This theory gained widespread support within the abolitionists' camp during the 'Anti-Patent' debate of the late-19th century.[62]

However, not all opponents of the system were willing to trust the head start gained by the inventor as guaranteeing sufficient remuneration to justify embarking on the inventive process. Indeed, Macfie, perhaps the most vocal of the critics of the patent system during the mid-to-late-19th century, was of the opinion that the open market could not be trusted to secure sufficient reward to the inventor to compensate him for his time and effort. He opposed patents on a number of grounds, including: that they hurt free trade; that too many obvious inventions are patented; that under the patent system rewards rarely go to those who deserve them, and are never in proportion to their contribution to the state of the art; and that a great number of patents are based on old ideas or are useless.[63] However, Macfie was of the opinion that some kind of reward was needed to compensate for the speed with which competition would act to wipe out any profit that could be made from the innovation. He therefore proposed a system of monetary reward by prize or bonus determined according to the social utility of the invention as the best method of providing for the inventor.[64] Similarly, *The Economist* supported the abolition of the patent monopoly and suggested instigating a system of direct monetary grant in its place, stating; "... what the community requires is, that inventors be rewarded; that skillful *(sic)* men who contribute to the progress of society shall be well paid for their exertions. The Patent Laws are supported because it is erroneously supposed that they are a means to this end."[65]

---

[61] See Schäffle, *Die Nationalökononomische Theorie der Ausschliessenden Absatzverhältnisse*, (1873; Tübingen) at 141 and 150. Distilled from Machlup & Penrose, *op cit.* at 18; and Machlup, *op cit.* at 23.

[62] See comments to this end in Machlup & Penrose, *op cit.* at 18.

[63] See Macfie, *The Patent Question under Free Trade: A Solution of the Difficulties by Abolishing or Shortening the Inventor's Monopoly and Instituting National Recompenses*, (1863; W. Johnson, London; 2nd Ed); also Macfie, *Recent Discussions on the Abolition of Patents for Inventions*, (1869; Longmans, Green, Reader, & Dyer, London); see also Oppenheim, *Robert Andrew Macfie, Patents, Copyright, Libraries and Legal Deposit, [1998] IPQ 383*; and Machlup, *op cit.* at 23.

[64] See especially Macfie, *The Patent Question under Free Trade, ibid.* Such a system is akin to that adopted under Communist rule in the Eastern Bloc whereby the ownership of inventions was swapped for inventor's certificates and a monetary reward.

[65] *The Economist*, (London), July 26, 1851. Quoted from Machlup & Penrose, *op cit.* at 19.

Despite rational and cogent dissent, Mill, Smith and Bentham's economic arguments eventually won the day,[66] as it was considered that to reward the inventor with monetary bonuses would inject partiality or even corruption into the mix by giving, in essence, discretionary power to administrators. However, the simple fact that a proposal to hand out money did not win huge support, and thus close the debate, adds little to the argument that the provision of temporary monopoly can be justified on the basis that it rewards the inventor. At best all that can be said is that such means are not *less* favourable than a system of monetary grant. However, it should be clear from the foregoing discussion that the provision of monopoly power as reward to the inventor can be attacked on a number of fronts. Furthermore, the argument that a prize of any kind was *required* found criticism on grounds that it was often not the person most deserving of recompense that actually received it (whatever it may be) and that it was, in actual fact, impossible to apportion reward accurately with respect to the services rendered.[67] The patent system, as it stood, attracted further complaint, as it was impossible to prevent injury being inflicted upon others by restriction of their right to pursue inventive endeavours in areas protected by patents.[68]

The reward theory, as a justification for the patent system, also raises a number of further questions that are difficult to answer and which potentially prejudice its validity. First, if the inventor is being rewarded, what are they actually being rewarded for? What is the rationale for being given monopoly privilege? If the patent is granted for their labour then this returns us to the Lockean construct of property based on the natural rights of the author, and, as has been noted, this is not a concept that many take seriously. If the patentee is rewarded for having a good idea then this moves us to ask why it is only the first to take their invention to the Patent Office that receives the reward? What is there in the nature of invention that makes independent re-creation less worthy than the initial creation? As Sir Roundell Palmer stated before the 1871 Select Committee: "The knowledge used by inventors is like air, or light, or whatever else is universal and simultaneously capable of enjoyment by all."[69] Therefore, why, if

---

[66] Or at least did not lose.

[67] See, for example, the speech of Lord Stanley (chairman of the Royal Commission that inquired into the patent system in 1863-5) in the House of Commons, May 28, 1868. Reproduced in Macfie, *Recent Discussions on the Abolition of Patents for Inventions*, *op cit.* at 111; Also Machlup & Penrose, *op cit.* at 20.

[68] Macfie, *Ibid.*

[69] *Report of the 1871 Select Committee*, *op cit.* at 690.

the knowledge is such a resource, should only the first person to come up with an idea be rewarded for it? This collision between theory and reality within the system simply did not make sense.

Therefore, as Machlup & Penrose state: "If the patent system could not be credited with meeting the demands of distributive justice, it was still possible to defend it, not on the ground of justice, but on the ground of its social usefulness."[70] Thus we are brought to our third possible justification for the patent system, the incentive to invent.

The 'Incentive to Invent' Theory

The 'incentive' thesis is primarily economic in its nature, and therefore lies independent of the question of whether justice calls for inventors to be rewarded for their efforts. Whilst the hope for a just reward can, in itself, act as an incentive, it has been noted that it is often the case that a simple reward will not be sufficiently attractive to promote technological progress.[71] The 'incentive' theory therefore posits that in order for inventive activity to be maximised it is necessary to offer bait as well as simple reward. Its focus is therefore not on the inventor *per se*, but rather on a series of assumptions concerning the basic economics of the inventive process. The economic arguments underpinning the creation and sustenance of a system of temporary monopoly in inventions is a topic that is discussed more fully below,[72] the present discourse is therefore limited to the more superficial elements of the logical analysis.

The apparent nexus between the patent system and economic development, which paints patents as a "lever of industrial progress",[73] has enchanted proponents of the system since the theory was first advanced, and has undoubtedly been a factor in its becoming "probably the most quoted argument in favour of patents."[74] Indeed, Abraham Lincoln famously wrote, "the patent system added the fuel of interest to the

---

[70] Machlup & Penrose, *op cit.* at 20.

[71] See, for example, Machlup, *op cit.* at 23; Machlup & Penrose, *op cit.* at 21, and Dutton, *op cit.* at 21.

[72] See Chapter V, below.

[73] Machlup & Penrose, *op cit.* at 21.

[74] Dutton, *op cit.* at 20.

fire of genius"[75], and Chitty said that it was the most effective means of encouraging the "production of GENIUS."[76]

The rapid industrialisation of England and the U.S.A. were often utilised as cases-in-point to attest to the success of the patent system in promoting technical progression.[77] The argument was simple. As a matter of historical fact, by the end of the Industrial Revolution England had become the first global 'superpower' with Empire covering close to a quarter of the planet. England had a patent system during this time and, it was therefore but a short leap of faith to infer a causal relation between the two. Thus Price, writing at the beginning of the 20th century was able to conclude that the monopoly policy, which began under Elizabeth, had, despite its problems, produced a "system of patents for the effective *encouragement* of invention."[78]

However, as with any theoretical justification of the patent system, the 'incentive' argument attracted its share of criticism, not least that based on an equally logical inference between the technological progression of Germany and Switzerland and the fact that they respectively offered little or no patent protection at this time.[79] Indeed, some commentators suggested that the development of English industry had occurred *in spite* of the patent system, but remarked that this development was less than it would have been in its absence.[80] The accuracy of this, or indeed the contrary conclusion, is

---

[75] Lincoln, *Discoveries, Inventions, and Improvements* (1859) In *the Complete Works of Abraham Lincoln* (1905; Francis D. Tandy Co, New York; 3rd Ed.) Volume 5, at 113.

[76] Chitty, *A Treatise on the Laws of Commerce and Manufactures, and the contracts relating thereto,* (1820-24; Henry Butterworth, London) Volume I, at 6. Quoted from Dutton, *op cit.* at 21 (emphasis in source).

[77] See Machlup & Penrose, *op cit.* at 21.

[78] Emphasis added. See Price, *The English Patents of Monopoly* (1913; Harvard University Press, Cambridge (Mass)) at 131.

[79] See, for example, Böhmert, "Die Erfindungspatente nach volkswirtschaftlichen Grundsätzen und Industriellen Erfahrungen: mit besonderer Rücksicht auf England und die Schweiz", *Viertelijahrschrift für Volkswirthschaft und Kulturgeschichte*, Siebenter Jahrgang (1869) XXV, at 48. Taken from Machlup & Penrose, *op cit.* at 21.

[80] See Böhmert, *op cit.* at 79. Taken from Machlup & Penrose, *op cit.* at 21. See also the remarks of the *Times* newspaper of 19th December 1850 "The more we investigate, the more certain will be our conclusion and belief that we are a great and prosperous people, not in consequence but in spite of the legal system under which we live." Quoted from Coulter, *op cit.* at 41.

impossible to judge as both are based on a logical analysis of the facts as presented, the gaps, as they are, filled with reasoned conjecture.

Whichever statement holds the greater grain of truth, the 'incentive' theory has weathered the years well, often being uttered in the same breath as the reward theory as an accepted justification underpinning the patent system. Despite having been criticised as an overly simplistic analysis as far as the modern economics of the patent system is concerned,[81] it is an argument that is still routinely utilised to justify the system today by Parliamentary Committees,[82] academics,[83] and the courts.[84]

When used as an explanation of the beneficial effects of patents, the theory balances upon a number of assumptions, these can be succinctly summarised as follows. First,

---

[81] See, for example, Scotchmer, *Standing on the Shoulders of Giants: Cumulative Research and Patent Law*, *(1991) 5 Journal of Economic Perspectives 29* (hereinafter Scotchmer, *Giants*).

[82] See *The British Patent System: Report of the Committee to Examine the Patent System and Patent Law* (The Banks Committee), (July 1970) Cmnd. 4407 at 1, "The primary intention of the patent system is the encouragement of new industries in the country."

[83] See, for example Turner, *The Patent System and Competitive Policy*, *(1969) 44 NYU L. Rev. 451*; Kitch, *The Nature and Function of the Patent System*, *(1977) 20 Journal of Law & Economics 265*; Taylor & Silberston, *op cit.* Ch. 2; This argument is implicit in the treatment of the system by Merges & Nelson, *On the Complex Economics of Patent Scope*, *(1990) 90 Colombia Law Review 839*; Dam, *The Economic Underpinnings of Patent Law*, *(1994) 23 Journal of Legal Studies 247*; and Maskus, *Intellectual Property Rights and Economic Development*, *(2000) 32 Case Western Reserve Journal of International Law 471* at 473 to name but a few.

[84] A brief perusal of recent cases provides ample support for this proposition. See, for example, the comments of Lord Oliver in *Asahi Kasei Kogyo*, *[1991] RPC 485* at 523 where he states that: "The underlying purpose of the patent system is the encouragement of improvements and innovation." Further the Court of Session (Outer House) has explained: "The primary purpose of the patent system is to encourage the development and exploitation of new ideas." *Goddin and Rennie's Application*, *[1996] RPC 141* at 161. The view of the Patent Office is strikingly similar: "The patent system has hitherto constituted the best tool to encourage research." – in *Research Corp's Supplementary Protection Certificate*, *[1994] RPC 387* at 398. Most recently, Jacob J has stated that "...patents are provided to encourage research." – *Teva Pharmaceutical Industries Ltd. v Instituto Gentili SpA*, *[2003] FSR 498*. American judicial opinion is apt to voice this justification slightly more vociferously: "Strong patent protection is key to encouraging innovation, economic growth, and American competitiveness" per Circuit Judge Linn in the en banc decision of the CAFC in *Festo Corporation v. Shoketsu Kinzoku Kogyo Kabushiki Co*, *234 F.3d 558* (2000, CAFC, *en banc*) at 621. Further, see *Loctite Corp. v. Ultraseal Ltd.*, *781 F.2d 861* (1985, CAFC) at 876-7 "... the purpose of the patent system is to encourage innovation and its fruits." Quoted with approval in *Intergraph Corp. v. Intel Corp.*, *195 F.3d 1346* (1999, CAFC) at 1362.

that growth and industrial progress is socially desirable. Second, that invention is necessary for this progress. Third, that the level of invention will be sub-optimal without incentives, and finally that patents are the cheapest and most effective way in which these incentives can be provided.[85]

The first two of these assumptions are wholly uncontentious, being readily accepted by both sides in the 'Anti-Patent' debate. In this context, it should be noted that the 'abolitionists' never advocated a Luddite philosophy, but rather insisted that, far from encouraging invention and economic growth, the system acted only to stifle technological progress. Therefore, the opposition can be grouped into those who disagreed with one, or both, of the latter assumptions.[86]

The argument that there will be sub-optimal levels of invention in the absence of incentives can be traced to the policy behind the establishment of the Elizabethan patent custom. It will be recalled that the pro-activity of the Crown at this time was a product of concern over securing improvement of the Realm, and that early grants of patent privilege were aimed at those industries featuring most prominently on the list of imports.[87] The majority of abolitionists did not seek to contest this pedigree, conceding that artificial incentives may well have been necessary in pre-industrial Britain. However, times had changed, and by the mid-19th century not everyone saw invention as a creature in need of nurturing. As Coulter states: "Rather than deny the historical utility of the patent grant altogether, they [the abolitionists] argued that patents had served their purpose and now could safely be dispensed with."[88] Thus, Macfie is quoted as saying that: "The wisdom of our ancestors is not discredited, when, now that circumstances have completely changed, we abandon a system of restraint that is no longer tenable."[89]

---

[85] See Machlup & Penrose, *op cit.* at 21; Walterscheid, *Antecedents (Part IV)*, *op cit.* at 105 omits the final point in his list; Dutton, *op cit.* at 20, simply states that the theory "... assumes that the supply of invention (which was also assumed to be a major cause of growth) would be less than it would otherwise be if patents were not used to protect the inventor."

[86] The legitimacy of these assumptions is considered in more detail in Chapters IV & V, below.

[87] See further Chapter II, above. Also MacLeod, *Industrial Revolution*, *op cit.* at 12.

[88] Coulter, *op cit.* at 89.

[89] Macfie, *Patent Questions under Free-Trade*, *op cit.* at iv; see also Coulter, *op cit.* at 89.

Therefore, some abolitionists, and even some supporters of the system who felt able to justify it on different grounds, attacked the idea that there was a need to stimulate invention. Sir William Armstrong, president of the British Association for the Advancement of Science in 1863 is reported as saying that "the seeds of invention exist, as it were, in the air, ready to germinate whenever suitable conditions arise, and no legislative interference is needed to ensure their growth in proper season."[90] A number of contemporary patent agents, it seems, also shared this view. One is quoted as saying that "A man of true genius can no more resist the exercise of his genius than he can resist the growth of his body ... nearly all those [inventions] deserving the name of "great" ... have been made without any regard to, or stimulus from the existence of Patent Law."[91] Macfie comments on this quote by asking: "If this is true of great inventions, how much more must it be of small ones?" [92] Furthermore, Turner, whist justifying the patent system on natural rights grounds, felt unable to accept that any incentive was required to induce invention. The inventive process, he stated, was a product of "a taste for experiment, a love of trying" that was characteristic of the English psyche, there was therefore no need for State intervention to promote such activity.[93] This was a view shared by William Cubitt, President of the Institute of Civil Engineers, who said of invention: "I think people will always invent anything that is useful and good, if it will answer their purpose to do so, even without reference to a patent."[94]

Such views did not, however, go unchallenged. "That some men could not help inventing might be true," noted Aston, a patent attorney, in his *Paper on the Patent Laws*,

---

[90] The opening address of the president, *Report of the 33rd Meeting of the British Association for the Advancement of Science*, (1864; London) at lii. Quoted from Machlup & Penrose, *op cit.* at 22.

[91] Reproduction of a letter by the author of *"A Popular Treatise on the Patent Laws"*, reprinted from the North British Daily Mail February 2nd 1875, in Macfie, *The Patent Question in 1875*, (1875; Longmans, Green & Co, London) at 46.

[92] Macfie, *The Patent Question in 1875*, *ibid.* at ix.

[93] Turner, *Counsel to inventors of Improvements in the Useful Arts*, *op cit.* at 4; Quoted from Coulter, *op cit.* at 80

[94] See *Report and Minutes of evidence taken before the Select Committee of the House of Lords appointed to consider of the Bill, intituled, "An Act to further amend the Law touching Letters Patent for Inventions" and also of the Bill, intituled, "An Act for the further Amendment of the Law touching Letters Patent for Inventions" and to report thereon to the House,* 1851, (*Report of the 1851 Select Committee)* House of Commons Sessional Papers, Vol. XVIII (Command Paper Nº 486) at 456.

"but as a rule men invent as they do other work, they invent to live or help them live."[95] Further, in his testimony to the 1851 Select Committee on Patents, Carpmael argued that, all of the steps in the "history of the whole of manufactures of this country ... have been founded upon patents from the earliest date up to the present time ... the whole system is built upon patents."[96] The supporter's arguments were also greatly bolstered by the fact that they could provide at least two concrete examples of foreign inventors bringing their inventions and expertise to Britain solely *because* of the patent system. In testimony before the 1871 Select Committee, for instance, Bessemer, the German born inventor of a revolutionary steel-making process that bears his name, told those gathered that he brought his invention to Britain because he was able to patent it here.[97] Furthermore, Isaac Holden, in evidence before the same Committee, gave the example of Switzerland, "where there is no patent law whatever of any kind, [and there] industry makes no progress, and the people are unemployed."[98]

A year later, before the 1872 Select Committee, the tide of opinion was even stronger, with Siemens, celebrated foreign inventor, Fellow of the Royal Society, and President of the Institute of Mechanical Engineers also testifying to the end that the patent system was responsible for his presence in Britain. It was, he said, "the fact of there being no properly understood and regulated Patent Law in Germany [that] induced me to come over to this country and make this my real home."[99]

Most critics of the patent system at this time did not, however, go as far as Armstrong *et al.*[100] and make such forthright pronouncements on the nature of the inventive process. Even Macfie, by proposing a system of monetary awards in place of the patent system, "demonstrated that he was as capable as his opponents of making exceptions to the general rule of laissez-faire: while they disallowed monopolies but allowed patents, he disallowed patents but allowed cash subsidies."[101] It will therefore come as no surprise

---

[95] Aston, *A Paper on the Patent Laws*, (1870; Manchester Institute of Engineers, Manchester) at 12-13; Quoted from Coulter, *op cit.* at 92.

[96] See *Report of the 1851 Select Committee, op cit.* at 281. See also Coulter, *op cit.* at 52.

[97] See *Report of the 1871 Select Committee, op cit.* at 746-62.

[98] *Ibid.* at 764.

[99] *Report of the 1872 Select Committee, op cit.* at 433.

[100] See text accompanying note 90, *et seq.*, above.

[101] See Coulter, *op cit.* at 98.

to the reader that the last of the above propositions,[102] was attacked on identical grounds to the grant of temporary monopoly as a *reward* to the inventor; i.e. that there are better, less harmful methods available.

Even if it is accepted that patents can be effective incentives for inducing inventive activity, it requires a certain leap of faith to move between this assertion and a statement that they are *necessary* to procure an adequate level of invention. As Walterscheid states: believing that the "supply of invention would be less than it would otherwise be if patents were not used to protect the inventor ... was one thing and proving it was another, but few bothered with any attempted proof."[103] Thus the literature is littered with bold assertions of principle on one side of the debate or the other. The vehemently pro-patent lobby based their arguments on the theoretical musings of Mill and Bentham, that patents produced "infinite effect and cost nothing". Taking more of a middle ground were those who argued that whilst patents were not totally free of social cost, the benefit that they provided far outweighed any such considerations. At the other end of the spectrum, others, such as Macfie, argued that monetary awards were more efficacious and socially cheaper incentives than patents.[104]

Bentham's bold assertion of the great social value of the patent system and the absence of any associated social costs is not, it is respectfully submitted, a view that finds much, if any, grounding in truth. At even the most elementary level it will be appreciated that the patent system is not *devoid* of such burdens. Indeed, the view that patents 'cost nothing' is not a view that was accepted by the various Royal Commissions and Select Committees appointed in the latter-half of the 19th century to examine the question in detail. Instead they concluded that the heavy social costs associated with the operation of the laws were an unavoidable by-product of their existence.[105] This is not to say that

---

[102] That patents are the cheapest and most effective incentives to invent.

[103] Walterscheid, *Antecedents IV*, *op cit.* at 105.

[104] Macfie, *The Patent Question under Free Trade*, (1864; Unknown, London; 2nd Ed) at 29; See also Machlup & Penrose, *op cit.* at 22.

[105] See, for example, the closing comments of the Royal Commission of 1863 where it is stated that "the inconveniences now generally complained of as incident to the working of the Patent Laws ... cannot be wholly removed. They are ... inherent in the nature of a Patent Law, and must be considered as the price which the public consent to pay for the existence of such a law." *Report of the Royal Commission to Inquire into the Working of the Law Relating to Letters Patent for Inventions 1864* (Command Paper Nº 3419).

they are therefore without justification, quite the contrary, it simply serves to divert attention from bold policy considerations to more concrete comparison between the social costs and benefits of the system.

Thus Grove QC, an ardent abolitionist, when called to give evidence to the 1871 Select Committee on Patents, stated that "the sole ground on which letters patent can be held to be justifiable or permissible, is that they are beneficial to the public. If they are, and, so far as they are, keep them; if they are not, abolish them."[106] He concluded that patents were not.

According to the abolitionists the patent system failed to satisfy the public benefit criteria on a number of grounds. Macfie, as ever, was highly vocal in his condemnation, stating that the provision of royalties to an inventor effectively resulted in taxation of the public due to the associated increase in prices.[107] Another commonly voiced concern was that the uncertainty of the patent grant, when combined with the prohibitive cost of securing protection, rendered the system at best a lottery and at worst an elaborate mechanism designed to swindle the unwary.[108] It should be noted that this criticism was also one used by those on the other side of the debate in order to justify amendment of the system, although the injustices were not painted quite so graphically.

In addition to questions raised about the efficacy of the patent system in promoting invention *per se*, some contemporary commentators further inquired into the roots of its function, examining if indeed it did promote such activity. In short they asked if there was an additional social cost associated with the fact that incentives were given to invent. Where, in reality, did the resources diverted to the inventive process by the bait of the patent system actually come from? And was their re-diversion economically justifiable?

---

[106] *Report of the 1871 Select Committee*, *op cit.* at 7.

[107] See, for example, Macfie, *Cries in a Crisis for Statesmanship Popular and Patriotic to Test and Contest Free-Trade in our Manufactures*, (1881; Edward Stanford, London) at 30.

[108] This opinion is amply illustrated by reference to the evidence placed before the 1829 Select Committee. See *Report of the Select Committee on the Law Relative to Patents for Inventions* (1829) Parliamentary Papers III (Command Paper Nº 332).

This argument, that the inevitable effect of the patent system was to divert existing activities from areas where they might most benefit into areas in which they would be most profitable, became one of the mainstays of the abolitionists' arsenal. It provided the campaign against patents a sound economic platform from which to launch their assault. As Prince-Smith said, patents "do not promote inventive activity ... they merely steer it into uneconomic channels".[109] It is a simple argument with a great deal of emotive strength; moreover, it is an argument that is difficult to defend against. However, it is also an argument concerning damage that it impossible to quantify and therefore other, more tangible factors, came to be counted at the fore.

Amongst the most touted of these was the bureaucratic cost of administering the system, "the court personnel, lawyers, agents, and others engaged in prosecuting patent applications and litigations."[110] However, far more pernicious was the suggestion that the mere existence of the patent system was enough to discourage improvement as the fear of being charged with infringement "haunt[ed] the potential user of new technology and discourage[d] him from attempting to improve his technique."[111] Indeed, even Brunel complained that he "could hardly introduce the slightest improvement in [his own] machinery without being stopped by a patent."[112] Therefore, one of the strongest arguments of the pro-patent lobby, that patents were acceptable, as they did not deprive the public of anything that they formerly had enjoyed, now attracted criticism. The patent system, the abolitionists cried, served to rob the inventor of the opportunity to evolve and improve upon their inventions. Furthermore, there was a distinct possibility that more than one inventor may have been working towards the same goal, only for the first to get to the patent office to be given a monopoly to the exclusion of the others. The fact that "[y]ou can never prove that some other persons have not already invented, or will not soon invent, anything that is the subject matter of a patent"[113] meant that the monopoly served to exclude the public from using the same idea as the

---

[109] Prince-Smith, *"Ueber Patente für Erfindungen"*, Vierteljahrschrift für Volksswirthschichte, Volume III, at 161. Quoted from Machlup & Penrose, op cit. at 23.

[110] Taken from Machlup & Penrose, *op cit.* at 23.

[111] Batzel, *Legal Monopoly in Liberal England: The Patent Controversy in the Mid-Nineteenth Century, [1980] Business History 189* at 191, referencing Hawes, *On the Manufacture of Soap, (1856) IV Journal of the Society of Arts 320.*

[112] See *Select Committee on Patents 1851* at 248.

[113] Macfie, *The Patent Question in 1875, op cit.* at 32.

patentee had.[114] The *Economist* led the charge by stating that "[o]n all inventors [a patent] ... is especially a prohibition to exercise their faculties; and ... it is an impediment to the general advancement [of society] with which it is the duty of the legislature not to interfere"[115]

The actual economic costs of these public disincentives of the patent system are difficult to gauge, and it adds little to our discussion to enter into detailed analysis of the pros and cons of the system extant in the late-19th century. At the time these arguments were first voiced the institutional structure of the grant was very different to that of today. Further, the doctrine of precedent was still in its infancy, not yet fully augmented by the systematic reporting of cases. Litigating a patent was a highly dangerous and costly process, a voyage only embarked upon by the bold or the reckless. The judiciary was considered to be distinctly anti-patent and the specification, although over 100 years old by the mid-19th century, was still underdeveloped. However, the commentators of the time raised many objections to the patent system that were not based on administrative inefficiency or judicial hostility, but which had their footing in a heartfelt distrust of the patent system *per se*. Many of these arguments are no less relevant now as criticisms pertaining to the philosophical justifications of the system than they were when Macfie was writing. Indeed, the modern economic literature has recently returned to the 'old' arguments and finally begun to acknowledge the true complexity of the problem; that the patent system not only acts as an incentive to invent, but also acts to block invention.[116]

Realisation that the system could act as both incentive and dis-incentive to invent added serious weight to the abolitionists' arguments that the social costs of the system outweighed its benefits. If it could not be said with any certainty that the 'carrot on a stick' approach was efficacious in procuring invention where there would otherwise be none then, it was argued, the system not only harmed progress, but also charged the public for the privilege!

---

[114] See Machlup & Penrose, *op cit.* at 24.

[115] The *Economist*, February 1st 1851. Quoted in Machlup & Penrose, *op cit.* at 24.

[116] See, for example, Scotchmer, *Giants*, *op cit.*

It should be noted, however, that at the time that these arguments were first advanced there was still a strong attachment to the image of the inventor as a hero.[117] The idea of the inventor as an individual, working alone in his workshop, who could not help but invent and whose driving force was the desire to aid the progression of the Empire, was strong. Stories of achievement in the face of adversity were commonplace. Figures such as Watt and Brunel in England, and Edison and Whitney in the U.S. were prominent role models to be emulated. The country was still riding high on the crest of the Industrial Revolution and had not yet reached the point where corporate research and development had seized the day. Therefore, it is hardly surprising, as Machlup & Penrose simply state, "that the function of the patent as a stimulus to the inventor's financier was not given ... the full emphasis that it now has."[118] The significance of this point is enhanced by the realisation that the cost of obtaining and defending a patent was so prohibitive that "[t]o make the property worth anything, a capitalist must take it up; but the capitalist, in doing so, stipulates for the lion's share of the profit. Probably in ninety-nine cases out of a hundred the reward was obtained by such speculators, and not by inventors."[119] Therefore, to quote Bentham slightly out of context: As "he who has no hope that he shall reap, will not take the trouble to sow,"[120] the logical conclusion drawn from the practical cost of the patenting process was that it could not actually perform to induce *invention.*

Furthermore, the incentive thesis in its raw, pre-modern, form can only act as justification for those inventions actually induced by the offer of a patent. A causal relationship is required: But for the patent system, the invention would not have been made. Strict interpretation of this requirement focuses attention on the motivation behind the invention and necessitates the removal of protection from serendipitous or accidental creations. It should be noted that when these arguments were first advanced the process of invention was poorly understood. The inventor was, by-and-large, an individual and this is reflected in contemporary writing. References are found to invention only; innovation, investment in research and development, the process of

---

[117] See MacLeod, *Concepts of Invention and the Patent Controversy in Victorian Britain*, in Robert Fox (ed.), *Technological Change: Methods and Themes in the History of Technology*, (1996; Harwood Academic Press, Australia) (hereinafter MacLeod, *Concepts of Invention*), at 137.

[118] Machlup & Penrose, *op cit.* at 25.

[119] The *Spectator*, June 5th 1869; Quoted from Machlup & Penrose, *op cit.* at 25.

[120] Bentham, *The Works of Jeremy Bentham*, (1843, William Tait, Edinburgh) Volume III, at 71.

inventing inventions, was an alien concept. Indeed, it is only at the beginning of the 20th century, due to the work of some highly influential economists[121], that we begin to see understanding unfold. It is at this point that we can observe the promotion of innovation, giving it primacy over invention, placing it at the centre of a modern appreciation of the system. It is this distinction between the act of invention and the inventive process itself that distinguishes the classical from the modern incentive theory.[122] However, for the present our discussion is limited to consideration of the classical incentive to invent.

The combined weight of these arguments may well have been fatal to any attempt to preserve the patent system as it stood, however, as already noted no one who took part in the highly public debate actually advocated maintaining the *status quo*.[123] Instead, the 'pro-reform' lobby used the argument to strengthen their calls for improvement of the administration of the system and to reduce the attendant costs. Also instrumental was the increased appreciation of the social contract theory of patent protection – that the patent could be seen as a bargain struck between the inventor and the public whereby monopoly was traded for knowledge. Thus, we arrive at our final justification of the patent system, that it is the best incentive to disclose secrets.

The 'Exchange for Secrets' Theory

The idea of the patent as a contract between the public (represented by the Crown) and the inventor, is a theory that can be traced back to the 'working' clauses often inserted into Elizabethan patent grants.[124] The notion of such a bargain gained strength from the emergence of the specification in the 18th century, and was a trump card played by

---

[121] Such as Schumpeter, *Theory of Economic Development*, (1936; Harvard University Press, Cambridge (Mass)).

[122] The modern, or post-classical, theory is discussed in Chapter V, below.

[123] Not strictly true. William Carpmael, it appears, was (according to the evidence of Thomas Webster at the 1851 Select Committee) "almost singular" in his defence of the system as it stood. He opposed change on a number of grounds, insisting that high fees kept down the number of frivolous patents. He was also "sceptical of the value of indexes and abstracts, dubious of the necessity for commissioners, and critical of the Designs Act Extension Bill, which, in his opinion, had only increased the amount of paperwork accompanying every application for protection." Coulter, *op cit.* at 52; see also the testimony of Carpmael before the 1851 Select Committee, *op cit.* at 265-317; and his testimony before the Royal Commission of 1864, *op cit.* at 354-73.

[124] Discussed in Chapter II, above.

proponents of the system during the 'Anti-Patent' debate. Three of the main treatises extant at the beginning of the crisis, those of Carpmael,[125] Hindmarch,[126] and Spence,[127] emphasised the contractual nature of the patent grant. Thus in Carpmael's *Law of Patents for Inventions, Familiarly Explained*, he states that the possibility of gaining a patent was:

> "... a great incentive to the exertion of ingenuity; as the ... [patentee] found themselves rewarded for their labour ... and the public were ultimately benefited by being made acquainted with the means of producing the invention, which became public property at the expiration of the term of the grant, or earlier."[128]

As Coulter states, this view of the patent as a bargain accorded with both the common law and the 'exchange' arguments of the classical economists. "Any restrictions that the patent placed upon use of the new manufacture ... were temporary ones acceded to by the public in return for the public in return for the information contained in the written specification."[129]

Hindmarch reiterated this point, rationalising that the only way in which the patentee could have exclusive property in his invention, once it was made public, was by the application of some positive law made with the actual or implied consent of the whole community.[130] Such consent was deemed to exist because of the benefits accruing to society from the publication of the invention where it might once have remained secret.[131] His authority for this conclusion came from the case of *Cartwright v Eamer*[132] in which Eldon L.C.J. (as he was then) opined that the patent grant should not be considered "in the light of a monopoly, as it had before been put by the judges, but as a

---

[125] Carpmael, *The Law of Patents for Inventions, Familiarly Explained, for the use of Inventors and Patentees*, (1832; G. Wightman, London).

[126] Hindmarch, *Treatise on the Law Relating to Patent Privileges for the Sole Use of Inventions*, (1846; V&R Stevens, G.S. Norton, and W. Benning & Co., London).

[127] Spence, *A Treatise on the Principles Relating to the Specification of a Patent for Invention*, (1847; V&R Stevens, and G.S. Norton, London).

[128] Carpmael, *The Law of Patents for Inventions*, *op cit.* at 3. Quoted from Coulter, *op cit.* at 78.

[129] Coulter, *op cit.* at 78. For a modern appreciation of the information function patents see Beier & Straus, *The Patent System and its Information Function – Yesterday and Today*, *(1977) 8 IIC 387*.

[130] Hindmarch was at pains to point out that patents, regardless of their social utility, were not a natural right of the inventor, rather they were a "matter of favour".

[131] See Hindmarch, *Treatise on the Law Relating to Patent Privileges*, *op cit.* at 1; see also Coulter, *op cit.* at 79.

[132] This case is referred to in *Harmer v Plane*, *14 Ves. (Jun) 131* (1807).

bargain with the public."[133] Therefore the question that should be asked of a particular specification in order that the patent is good was whether it "is such that a mechanist can make the machine from the description there given."

Like Hindmarch, Spence cited *Cartwright v Eamer* in support of his proposition that the specification was the consideration that the patentee provided for his bargain with the State, and which must therefore be "judged on good faith".[134] Coulter notes that Spence took this requirement very seriously, not only on legal, but also moral grounds; "warning against a deterioration of inward character that would surely result, whatever pecuniary award might be secured, from acting in bad faith."[135]

The 'exchange' theory as an example of the 'social contract' nature of the patent grant shares some roots with the incentive to invent. Indeed, it was often the case that they were deployed together as twinned justifications, two sides of the same coin. Lord Granville, speaking in the House of Lords Debate on the Patent Law Amendment (N^{o} 3) Bill 1851, did just this. He stated that "the only principle on which patents could be justified was, that the patent was a bargain between the inventor and the public, by which the inventor was encouraged to make inventions, and afterwards encouraged to make them known to the whole world." Granville, however, was in favour of abolition and concluded that in the "present state of the world" there was no need to offer such incentives, as "to scheme and invent was almost a madness with some people". [136]

By eliding the justifications in this manner, it is submitted that his Lordship missed the main point of the argument: the incentive to disclose is discrete of the incentive to invent. For, whilst it is common ground between the theses, for instance, that technological progress and industrial growth are socially desirable and that invention is necessary for this progress, crucially they differ in their expectations and estimations of the inventor. Both the reward and the incentive theses suffered at the hands of the

---

[133] See the statement of Romilly and Scott, counsel for the plaintiff in *Harmer v Plane*, *ibid.* at 131. Eldon's judgment in *Harmer v Plane* ends with his statement that "I adhere to the law, as I stated it in the case of *Cartwright v Eamer*" *ibid.* at 136.

[134] Per Eldon, LC.J., in *Cartwright v Eamer.*

[135] Coulter, *op cit.* at 80.

[136] See the speech of Lord Granville in the Lords' Debate of the Patents Bill 1851, *Hansard* (3rd Series), Volume 118, Cols. 12-17 for these quotes.

abolitionists' pre-conception that invention was, in essence, discovery. Viewing the inventive process in this way enabled opponents of the system to turn the argument that the patentee was owed by society for his intellectual expenditure around so that the patentee now owed society an "intellectual debt".[137] As Stirling, a Glasgow manufacturer, stated: the "inventor has the benefit of all foregone human thought, of all existing civilisation. He has the unbought advantage of all laws, all language, all philosophy. He has the free use of all methods and appliances, spiritual and material, which have been painfully elaborated by the thinkers and workers of all time. Why, then, should he alone have an exclusive privilege in respect of the infinitesimal addition which he makes to the work of ages?"[138]

The exchange theory enabled the pro-patent lobby to side-step this difference in views and to say that even if the abolitionists' view of invention was correct, the patent system could still be supported on the ground that it encouraged the dissemination of knowledge. It did not matter about the 'whys and wherefores' of the inventive process, the important thing was that without some incentive the inventions that contributed to the technical prowess of the nation, of which all were so proud, would go to the grave with their creators. The patent, it was argued, should not, therefore, be seen as a privilege, but rather as the result of a bargain between the inventor and the State, whereby the inventor agreed to tell the world of his invention in return for a temporary monopoly.[139] Put simply, a "patent is the price of disclosure".[140]

Predictably, the argument did not proceed unchallenged. The *Economist*, for example, doubted that the technological progress of the State would be at all harmed if inventors were not encouraged to disclose their inventions as "nearly all useful inventions depend

---

[137] See Coulter, *op cit.* at 85.

[138] Quoted in Macfie, *Recent Discussions on the Abolition of Patents*, *op cit.* at 119. See also Coulter, *op cit.* at 86.

[139] See further, Machlup & Penrose, *op cit.* at 26; Dutton, *op cit.* at 22, Machlup, *op cit.* at 24 and Coulter, *op cit.* at 94-5.

[140] Dutton, *op cit.* at 22, attributes this quote to the testimony of John Farey before the 1829 Select Committee, at page 21 of the report. Although Farey's testimony appears at this page the quote does not. On the following page, however, when discussing the priority of two competing applications, Farey is reported as saying: "The first applicant who is able, and willing, to make disclosure of the secret, ought to have the patent, that is to be given as the price of such disclosure." *Report of the 1829 Select Committee on the Law Relative to Patents for Inventions*, *op cit.* at 22. It is assumed that Dutton was misquoting this reference.

less on any individual than on the progress of society."[141] In making this point the abolitionists aimed to distinguish the patent system from copyright, which the literary property debate of the late-18th century had settled as intrinsically valid. Thus, Rogers, dismissed the claim "that literary works and inventive adaptations are identical in their nature ... each literary work is a unique creation, capable of distinct appropriation and limitation..." inventions, on the other hand, lacked the required uniqueness.[142] Therefore, the counter-argument went, if an inventor wished to keep his creation secret, so be it, it would not be long before another made the discovery and bought the innovation to the masses. Such an argument is, however, dependent not only upon the view that inventions exist in the ether, waiting to be made, but also the assumption that the next person to 'invent' the same improvement would choose, or be forced, to make it public. Whilst the probability of the invention moving to the public domain will increase with the number of people practising it, it is still far from certain, in the absence of any incentive, that such a move will be made, especially if it can be effectively concealed.

Critics of the theory argued that an invention would inevitably leak to the public even if its creator tried to keep it secret. They stressed the difficulty of maintaining secrecy, suggesting it was so great that, under the social contract theory, protection was given for nothing in return. The difficulty of keeping most inventions secret was a point that had previously been utilised by the those in favour of the system in order to justify its existence. Indeed, even with patent protection in Britain there was considerable concern, justifiably so, that patented technology would be stolen and sold to foreign industry who did not have to abide by such laws, and who could then undercut British manufacturers.[143] Supporters of the system had cited the ease with which competitors could adopt unprotected technology and thereby profit from the 'true' inventor's

---

[141] *The Economist*, July 26, 1851; Quoted from Machlup & Penrose, *op cit.* at 27.

[142] Rogers, *On the Rationale and Working of the Patent Laws*, *(1863) 26(2) Journal of the Statistical Society of London, 121* at 135-8. See also, Coulter, *op cit.* at 86.

[143] This concern was most apparent within the textile industry during the industrial revolution where many measures were adopted in order to stem the flow of valuable information out of the mills and into the hands of outside (especially foreign) interests. Thus mill windows were made small and high so that outsiders could not easily look in, oaths of secrecy signed by the workers were commonplace, and in 1719 and 1750 Parliament imposed restrictions to prohibit skilled artisans and manufacturers from emigrating. See Coulter, *op cit.* at 24.

ingenuity, and now suffered from the success of their argument. However, this did not stop them defending the system on this ground, even "if the possibility of maintaining secrecy was confined to special circumstances."[144] In addition, they questioned the competitive advantage that the abolitionists said would be gained by all in the absence of patent protection, wryly asking; "When do we hear of an important invention coming to maturity in Switzerland?"[145]

A consequence of the need to keep an invention secret before a patent was obtained led some opponents of the system to claim that, rather than encouraging disclosure, it actually promoted secrecy. Prince-Smith states that, in the absence of a patent system, "secret and isolated work would cease and its place would be taken by a cooperation of all qualified talent."[146] Interestingly, the model of scientific research he advocates closely resembles the corporate led research efforts of the present day. However, these comments apparently provoked little, if any interest during the debate, probably due, at least in part, to the entrenched view of the lone inventor battling against a sea of competition.[147]

The difficulty of maintaining secrecy led the system's opponents to their third criticism of the theory: only those inventions that could not be kept secret would be patented. With this in mind, Rogers described the 'bargain' between the patentee and the public as "thoroughly one-sided" as the inventor only seeks to obtain a patent where he fears that his invention will be discovered.[148] Machlup & Penrose quote the German Economists, Böhmert and Rentzsch as holding that this argument alone reduced the exchange theory

---

[144] Machlup & Penrose, *op cit.* at 27. They quote J.R. McCulloch as stating that "it would plainly be for the interest of every one who made a discovery, to endeavour, if possible, to conceal it. And notwithstanding the difficulties in the way of concealment, they are not insuperable; and it is believed that several important inventions have been lost, from the secret dying with their authors." McCulloch, "Patent," *A Dictionary of Commerce and Commercial Navigation*, Volume II, at 274. Machlup & Penrose, *idem.*

[145] Day, *On Patents for Inventions*, (1870; Smith & Sons, London), at 35. Quoted from Coulter, *op cit.* at 97.

[146] Prince Smith, *"Ueber Patente für Erfindungen"*, Vierteljahrschrift für Volksswirthschichte, *op cit.* at 160; Quoted in Machlup & Penrose, *op cit.* at 28.

[147] For a picture of the inventor and their creations in Victorian Britain see MacLeod, *Concepts of* Invention, *op cit.*

[148] Rogers, *op cit.* at 128.

to tatters.[149] However, as we shall see, it suffers from a similar inadequacy to that of Granville's attack on the system in the Lords.[150] It will be recalled that his Lordship elides the issues and assumes that incentive and exchange are so intertwined that the mere fact that "to scheme and invent ... [is] almost a madness with some people" justifies abolition of the system. In doing so he ignores the distinction between the two justifications and paints the system with too wide a brush, disregarding the fact that different areas of technology, different inventions, can be justified in different ways. Böhmert and Rentzch, on the other hand, separate the theories too much and, in doing so, make the same mistake. They fail to see the continuum of invention, the spectrum of technology, much of which cannot be kept secret but which needs special incentive to appear at a socially beneficial rate, and the few inventions that must be coaxed from the fog of secrecy that would otherwise enshroud them. In treating invention as something inherently likely to leak to the public, they highlight the need for a system that protects the inventor from misappropriation of his idea, and therefore implicitly offer justification for the system.

Postscript

We have charted the move from the systematic grants of monopoly privilege in the late-16th century to the reforms of the late-19th century and the philosophical debate that accompanied them in order that we understand the causes that shaped the modern picture. Monopoly had tainted the early grants, and in the same manner *laissez-faire* and free-trade sentiment had forced a reconsideration and detailed examination of the system in the late-Victorian period.

The odour of monopoly still hung in the air, but opinion was divided about whether such bad blood extended to patents. Abolitionist rhetoric appealed to the sense of injustice that flowed from the pernicious patents of Arkwright and his kin; the media became involved and the debate was taken to the masses. However, even the most vocal of the abolitionist crowd did not fully embrace the *laissez-faire* attitude and advocate removal of all state intervention in the inventive process. True, there were those that upheld this heterodox attitude, but it would appear that this sentiment, the

---

[149] Machlup & Penrose, *op cit.* at 27, quoting Böhmert, *Die Erfindungspatente nach volkswirtschaftlichen*, *op cit.* at 67, and Rentzsch, "Geistiges Eigenthum", *Handwörterbuch der Volkswirtschaft*, (1866; Leipzig) at 629.

[150] See text accompanying note 136, above.

true *laissez-faire*, went practically unnoticed during the debate. Battle lines were drawn and territories marked, which divided those who advocated abolition from those who wanted reform, little attention was paid to the nuances of dissent.

Most critics that called for abolition were forced to bow to the weight of history. Being unable to prove that there was no link between Britain's prosperity and the patent system, between patents and progress, they were forced to attack the system on less concrete grounds, to suggest that there were better, more cost-efficient methods of promoting the 'useful arts'. *Laissez-faire* sentiment was all 'well and good', but it did not really gain the same foothold in Britain that it did on the Continent. Very few, and certainly not Macfie, despite his hatred of the patent system, trusted an unregulated market to harbour the required amount of inventive activity to keep Britain 'Great'.

By the beginning of the 20th century a much-improved patent system had been created. Reforms prompted by the 'Anti-Patent' debate had been implemented and many of the hallmarks recognisable today, such as preliminary examination, fence-post claims, priority arising from application rather than grant, etc., were in existence. Fees had been reduced and the application process simplified, however, the distrust of monopoly was still in the air. The specification had assumed its place at the centre of the grant and, perhaps due to the changing face of invention, the last vestiges of the patent grant being a grant of Crown favour, and the lack of any lack of any anti-trust laws, it was being judged with a highly critical eye.

Thus, by the end of the 19th century, two distinct conceptions of the patent system are in evidence. The first is that of the patent as a tool of commercial leverage, as reflected in the works of Smith, Bentham, Mill and others in the pro-patent camp. The second is that of the patent as a constraint on trade, the old monopoly argument, demonstrated by Macfie, Rogers, Grove and the other abolitionists. The Courts by this time had become somewhat mired by their newly created precedents and old views of property to be defined and claimed as one would claim land, boundaries fixed. The legal system was ill equipped to deal with treating the intangible as property; patents did not fit within existing constructs of excludability and exhaustibility that had been used to define and justify the concept in the past. Therefore the courts did the only thing that they could do, they treated invention like land and required that it be defined accurately

and precisely, they stated that what is not claimed is disclaimed, and in doing so they promoted the specification to the fore. It was no longer simply sufficient to work the invention and therefore introduce the technology to the Realm in that manner, now the workings had to be taught to all who would care to read about them. Bureaucracy had built up around the specification and the smallest of errors could cause invalidation. The grant was still too close to the Crown for any other rule to apply, but the gap was widening.

The political economists were keen to mark the patent as a tool of commerce, a mercantile invention and to cut it free from the mire of its roots. Furthermore, the nature of invention had changed. The image of the lone inventor was on its way out; replaced by the new corporate structure of research and development, but the underlying rationales stayed the same. Technical progress was good for the country, invention was necessary for technical progress, and the patent system existed to encourage, promote, and reward. It had history on its side.

For ease of expression the grounds of justification in the preceding pages were separated in wholly unnatural ways. The reader is reminded of the assertion made at the beginning of this discussion to the effect that no *one* theory can adequately explain and justify the provision of temporary monopoly to the inventor of a new product or process. It was necessary to draw out the arguments and to comment on each individually in order to provide the necessary background for the following investigation into the realities of the system as it now stands. Therefore, with the aid of an empirical study conducted by this author into the process of claim drafting, we ask, does the philosophy fit the facts?

CHAPTER IV

Patents Within the Market Economy

Part Two

–

Classical Justifications in a Modern Setting

–

Does the Philosophy fit the Facts?

Introduction

Analysis of the patent grant cannot be undertaken utilising traditional definitions of property. Its area of influence is secondary, tucked behind the words used to define its scope. Yet the court's approach to the interpretation of patent claims, the tangible evidence of the intangible subject of protection, in early-20th century Britain is clearly influenced by traditional constructs of what property should be. Therefore, in Lord Russell's famous dictum in *E.M.I. v Lissen* that there is:

> "...no canon or principle which will justify one in departing from the unambiguous and grammatical meaning of a claim and narrowing or extending its scope by reading into it words which are not in it; or which will justify one in using stray phrases in the body of the specification for the purpose of narrowing or widening the boundaries of the monopoly fixed by the plain words of a claim." [1]

The analogy with tangible objects is clearly evident. In Land Law, for example, there is no principle of equivalence whereby the owner of a strip of land can prevent access to property outside of the literal fence-posts of his claim. The owner of an apple, for example, cannot prevent another (absent ingenious placing of the fruit) from coming within six feet of his prize on a claim of trespass by equivalents. Intangible property is, by its very nature, infinitely more complex and therefore does not stand up to close analogy. However, tangible property is something with which all of us is familiar, it is something that the human mind can directly relate to, and therefore the temptation to draw comparison is great, and the capacity for misinterpretation still greater.

Indeed, if the 'Anti-Patent' debate has taught us anything, it is that public perception of the patent system is not based on an in depth understanding of its inner workings, it is reliant upon popular misconceptions, emotive calls-to-arms and the stigmatic association with 'odious' monopoly. This view is reinforced when one considers the symbolic power of a patent. For example, it is irrelevant to the majority of the consuming public whether or not a patent will stand up in court. Validity is not their concern. Indeed, it is rare for the relevant members of the public to be able to distinguish between copyright, trade mark, patents and design rights at all.[2] For the

---

[1] *(1939) 56 RPC 29* at 41.

[2] One will often hear about copyright in an invention, or a patent in a book, etc., in the course of any given conversation on the topic of Intellectual Property, even among law students that have yet to be educated to the error in their ways.

public, the power of the patent is linked to their misunderstanding of the system and the suggestion of official endorsement that the word 'patented' implies. Recent illustration can be gathered from the public furore over 'basmati rice' patents in the United States.[3] Here the power of the patent is not seen to be in the monopoly that it provides, if indeed it can be called a monopoly at all,[4] but rather in the symbolic nature of the grant. The mere fact that a patent has been granted is sufficient to engender fear that there is monopolisation of the production of *all* basmati rice. The perception of such grants therefore reinforces the societal view of patents as 'odious monopolies', a view that is inevitably reflected in the treatment that Intellectual Property is given in the courts.[5]

If one accepts that the system is a part of a capitalistic society and that its abolition is not commercially possible, and further that the consumer is overwhelmingly self-interested in the present, with little-or-no scope for anything other than personal forward thinking, then a broad interpretation of a monopoly that would increase price is clearly not a popular option. The narrowest logical construction of the patent is that based on a literal interpretation of the claims. Indeed, on a purely proprietary analysis this is the only scope that can be justified. In order to expand from this position and offer any degree of equivalence it is necessary to have recourse to at least one of the philosophical or economic justifications of the patent system discussed above, or a variant thereof. Therefore, in order that we understand this basic position, the 'literal' core of the assessment of patent scope, it is necessary to inquire into the patentee's motivation in seeking a patent and the process of its construction. This investigation enables assessment of the intrinsic value of the grant and therefore allows better understanding of the economic considerations for the determination of scope. It also allows discussion of the totemic value of the patent and provides a point from which to examine the substance of the folklore claim that about 90% of patents on the register are invalid, and to ascertain whether, if true, this actually matters.

---

[3] A web search for "basmati rice patent" in any of the major search engines returns literally hundreds of articles, discussions, and web-site postings on the subject, very few of which display any knowledge, or even understanding, of patent law whatsoever.

[4] See text accompanying notes 9-27 in Chapter V, below.

[5] A good illustration of derisory treatment can be found in the Patents Court decision in *Zino Davidoff v A&G Imports Limited & Tesco Stores*, [2000] Ch. 127, where Laddie J. stated (at paragraph 36) that the trade mark can give its owner a "parasitic right to interfere with the distribution of goods".

Our first task is therefore to examine the patentee's motivation in seeking a grant in order that we can contrast the system's commercial and philosophical purposes.

Why Patent?

Based on the foregoing discussion the reader might be excused for thinking that the answer to this question is simple. The purpose of the patent system is clearly to foster invention, whether by reward or incentive. It is designed to further the technological prosperity of society; this was the explicit intention of the Elizabethan grants and there is nothing to suggest that things have changed. The patent provides protection from competition. The corollary of this is that one therefore obtains a patent in order that this benefit is realised. This said, the principal reason for patenting is to get monopoly protection.

This is a logical conclusion based on the facts as presented, and is superficially satisfying. There is a cause and an effect that naturally dovetail; the patent is justified on the ground that it promotes innovation/disclosure, because it awards a monopoly to reward, or stimulate, the inventor, or compensates him for letting society benefit from his idea. However, as Taylor & Silberston note, the "indiscriminate promotion of invention is clearly not a defensible economic objective from any point of view, except probably that of those who earn their living as professional inventors or research workers."[6] Therefore, we redraft our hypothesis and state that the patent system can only be justified if it causes, or rewards the correct *type* of inventive activity and attendant disclosure.

This argument is reinforced by reference to the requirements for patentability. Inventions must be new in order to gain patent protection.[7] In addition, they must contain an inventive step (i.e. not be obvious to the person skilled in the art, based on their specialist knowledge of the technical field in question).[8] Furthermore, they must be 'capable of industrial application' and not fall within one of the prohibited categories

---

[6] Taylor & Silberston, *The Economic Impact of the Patent System: A Study of the British Experience*, (1973; Cambridge University Press, Cambridge) at 28.

[7] s.2 Patents Act 1977.

[8] s.3 Patents Act 1977.

of things that are "not inventions" for the purposes of British law.[9] The legislation that implements patent policy is tuned towards the encouragement of inventive ideas that have been reduced to practice. Therefore, it is not possible to get patent protection for a discovery, as such, in the UK. However, one can obtain a patent for an invention that utilises a discovery in a practical manner, for instance the discovery of the virus responsible for Hepatitis C could be utilised to enable the manufacture of a testing kit which would not be excluded from patent protection on policy grounds.[10]

Everything is neat. The prospective inventor is encouraged to use their inventive faculties in order to create something new in an area that attracts patent protection. They are then encouraged to make this innovation known to the world in return for a patent, which they can use to keep everyone off their 'patch' for the time that is required for them to realise the value of their invention. The *raison d'être* of a patent is still the monopoly that it confers.

Under this view of the inventive process, the patent system acts in various stages to incite and reward invention and finally to demand that the inventor make it available to the public before compensating them for doing so. The theories are intertwined and therefore the scope of the monopoly granted should reflect this balance, it should extend to cover that which the inventor has disclosed where this is sufficient to encourage the invention to be made. The reward that is offered, or the incentive given, should relate to the contribution that the invention makes to society, and the scope of the patent should be determined by the technical contribution that it makes to the state of the art.

By placing the invention in a market unencumbered by direct imitation, the patent system enables the patentee to charge a monopoly price and therefore maximise the value of the invention and the attendant profits. This value will be primarily dependent on its utility, either to the user in terms of cost reductions etc., or to the consumer, arising because it provides a better, cheaper or simpler means of doing something. There is, after all, no value in something that nobody wants. However, the security of

---

[9] s.4 and s.1(2) Patents Act 1977 respectively.

[10] See *Chiron v Organon (N° 12)* [1996] FSR 153, although such a testing kit would still be liable to attack on grounds of novelty or inventive step.

this value is inextricably linked to the scope and stability of the patent itself, as the value of the invention is necessarily dependent on the availability of substitutes, the availability of substitutes is linked to the scope of the patent, and the scope of the patent determines *its* value as it controls the zone of exclusion. The patent is therefore the shell that protects the delicate invention that provides its value and utility. A patent, under this model, is obtained precisely because of its ability to exclude competition and provide monopoly profit to the enterprise that owns and exploits it.

However, there is at least one other reason for desiring patent protection that stands independent of the scope of the monopoly conferred. Obtaining a patent, rather than being a means to an end, may be an end in itself.

Motivation to Patent: Other Considerations

The real reason for seeking a patent may be a far cry from the traditional view of patenting for monopoly, and the purpose of patenting may have considerable consequences for the scope with which the specification and claims are drafted. As one patent attorney said when discussing the steps that they undertook in the creation of a patent application:

> "[The first question is always to ask] what they want a particular patent for, what they wish to cover with it. Do they want something that is fairly all embracing to keep people off their patch? ... Sometimes a client doesn't want a claim that is too broad because they don't want to tread on other people's feet – perhaps because they want a patent which is merely a licensing vehicle for a product that they have in mind and nothing more. Other times it's a fairly basic patent in which they want as much as possible protected to prevent other people from competing in one way or another with them. So that's the first point – why are you drafting with the breadth with which you are going to draft with? ... There are other reasons for patents. Some governments will ... give tax breaks to patent holders or the holders of patent applications, and the tax breaks may be worth an awful lot more than the cost of filing the patent application – and of leaving it pending for as long as possible regardless of its potential validity... You may wish to file a patent application to stop someone else from getting one by publishing it ... so you file your own application and just drop it, let it go, let it publish... [A] significant amount of others are gained because they are assets, regardless of how worthy they are. Venture capital companies see them and think that the entity holding them is worth putting money into – in a lot of cases they needn't even see a granted patent, they are just as happy with an application.

Therefore, it is easy to see that there are many reasons for obtaining a patent that don't necessarily conform to the traditional model of patent for protection.

The patent is a tool of commerce and will be obtained because there is a commercial advantage in doing so. Often the advantage is the monopoly protection, in which case

the scope of the patent will be crucial. However, it is apparent that this is not always the fact of the matter. For example:

> "There are some patents that people know they have that aren't valid, they're aware of the fact that there are major problems with their case. They would prefer that we didn't tell them that in writing, but they know that. But they like to have a large portfolio of patents. They have a few that they could sue people with and that they're happy with, but one of the ways that you can value your business is on the value of the IP that you own. So, "get me some patents, I don't really care that they aren't really valid and won't stand up in court, I'll never sue anybody with them" ... From that point of view, does it matter what I put in the claim? In that sort of case I don't need to worry so much about what will happen if this were ever litigated, because this one's not going to be. Their only purpose is to enable the patent holder to tell the shareholders that they've got 'X' number of patents world-wide."

The majority of those interviewed were able to recount first hand experience of this kind of 'patent grabbing', and all had at least anecdotal evidence of its existence. All areas of technology were considered to be equally susceptible, however in recent years it was noted that the 'dotcom' companies seemed to be leading the way in obtaining patents of dubious validity. The reasons advanced in connection with this observation were all very similar and centred around the fact that such companies were not very likely to have significant material assets against which to secure investment and this therefore forced their intellectual property holdings to the fore.

Where this is the case, and the prospective patentee knows that the invention that they are seeking to protect is less than wholly meritorious, the attorney will be drafting in the knowledge that the examiner is the only person they have to impress. In this case they know that the patent's purpose is to squeeze money from the banks, it will never be used in anger, therefore the attorney will modify their style accordingly. The scope with which they draft will be the scope that is likely to elicit the least objections; it will be pitched narrowly.

There are, in addition, some instances in which the scope with which the patent is drafted (which I shall call the 'intrinsic scope') will be determined by other motivations. One patent attorney gleefully recounted a case in which he had been instructed to specifically claim around one possible embodiment of an invention that would solve the same problem but would be prohibitively expensive to the point of lunacy.

> "[The patentee in such a scenario] doesn't want to keep the competitor right out, but wants him to see a method of manufacture ... that's so expensive that he can't

> compete in the market place – that amuses them a lot more than keeping them out altogether."

Others, when asked about this behaviour, simply stated that they had heard of such cases, but could provide no first-hand experience of the patentee's sense of humour.

Drafting a Patent: Determinants of Scope

It is clear from the foregoing discussion that the motivation for seeking a patent may have serious implications for the scope of the application. Those patents that are sought for reasons other than to ward off competition will be drafted in a manner designed to maximise the chances of getting the application through to grant. However, whilst certainly not universally, most patentees will, at least initially, desire to protect their invention from appropriation by others, and thus desire broad protection:

> "In general, you try and get the broadest cover that you can for the invention commensurate with what [the inventor has] come up with and what the prior art encroaches on."

The reasons for this are many and varied. They range from the fact that it is possible to amend a specification in the UK by narrowing the scope of the claims, but not by adding matter, to the view that a patent only protecting a precise embodiment is, at least under traditional thinking, not worth the paper it is written on.

> "It's a very expensive piece of paper to put on the wall and I can find much cheaper art that looks much better than any patent."

Therefore, assuming for the moment that the majority of patent applications are drafted in cases where the prospective patentee wishes to maximise their protection (or at least does not communicate their intention to restrict it to their patent attorney), it is prudent for us to inquire into what other factors may affect the 'intrinsic scope' of the patent. The first of these other factors is the stage within the process of innovation at which the patent is drafted.

Timing

The majority of patent systems, including the British, subscribe to the notion that the first person to file an acceptable application concerning a given invention is, in principle

at least, the person entitled to the grant of a patent on that invention.[11] This idea of the 'race to the patent office door' is clearly incompatible with any justification of the patent system based on a natural rights theory, but naturally dovetails with the idea of the patent as a social contract. It should be noted that some other countries, most notably the United States of America, grant patents to the 'first-to-invent' rather than the 'first-to-file'.

The first-to-file system is considered to have the benefits of simplicity and expediency, as it is far less complicated to determine who has filed an application first rather than who has created the invention first, but has the disadvantage of providing 'rough justice'.[12]

A consequence of the race to be the first-to-file is that the patent is usually drafted at an early stage in the process of innovation. The exact timing of the application will depend upon the perceived proximity of potential competitors; the fiercer the competition, the fiercer the race and therefore the earlier the application. Thus, if the particular research sector from which the invention emerges is notably dense, the patent is likely to be drafted very early in the process when the attorney will have little information at his or her fingertips:

> "[W]e become involved very much at an early stage [in the innovation process, although] ... it varies slightly ... depending on who your client is, whether you're talking about a small inventor or a multi-national chemical/drug company, they're after different things... [I]f you take pharmaceuticals as an example, they all know that their competitors are working in the same sort of field, so they can't really hang around for long enough to decide which one of a range of drugs is actually the good product because some other swine will be out there patenting it before you...
>
> We often come in at a stage where we don't really know ... which [of a number of possible chemicals] is going to be the active one. With a drug, at the time you're drafting the patent it's probably still on the drawing board. It might have been through the pilot plant – a few lab experiments will have been done ... It almost certainly hasn't been on a full-scale plant, so who knows what modifications will be made before actually bringing something out at the end. So at the time that you're

[11] In principle because a later application may, in fact, claim priority from an earlier application – section 5 of the Patents Act 1977 deals with the priority of applications.

[12] For a comparison of the relative benefits and disadvantages of the first-to-file versus the first-to-invent systems, see, for example; Nicolai, *First-to-File vs. First-to-Invent: A Comparative Study Based on German and United States Patent Law (1972) 3 IIC 103*; Kingston, *Is the United States Right about "First-to-Invent"? [1992] EIPR 223*; Roberts, *Paper, Scissors, Stone, [1998] EIPR 89*. See also; Parchomovsky, *Publish or Perish, (2000) 98 Michigan Law Review 926*; and Moore, *A General Period of Grace in a First to File World: Key Issues, [2002] IPQ 75*.

> drafting there's a lot of crystal ball gazing and a lot of our job is to say to people "could it work like this?" "Have you thought of this?""

Therefore, provided the patent is desired for the protection that it affords, the intrinsic scope will be initially broad, as it is far easier to reject claimed matter than it is to add new material. Where the application is made further along the line, the patent need not be as broad. By this point decisions have been made as to the best mode, and experiments have been done that show that various permutations will not work, therefore the scope can be trimmed to better fit the invention.

> "[Y]ou have to take a very practical attitude as to where you draw your fence around your invention in the sense that there is no point in drafting something so broad that it's never going to be valid, there's no point in drafting anything so narrow that it effectively teaches a 3rd party how to compete with you."

The trimming of the claim is all important as it enables the patent attorney to steer a course around what has actually been invented, therefore complying with requirements of sufficiency, whilst avoiding the submerged rocks that are the prior art.

Leaving the prior art aside for one moment, the only way that a net can be cast around the invention is if the patent attorney actually knows what has been invented. It may sound obvious, but problems with communication can provide great barriers to the creation of the intrinsic scope that an invention deserves.

The Importance of Knowledge

All of those questioned considered that the first, and most important, stage in the drafting of a patent specification was to obtain the relevant information from the inventor.

> "It seems banal to say this, but you can only include what you know, and so you can only draft with appropriate scope if you have sufficient knowledge of the invention and the way that the invention works to be able to do so."

It sounds deceptively simple, but most described this as the hardest part of their job, and further suggested it as the cause of failure for a number of well-known patents.

> "The *Van der Lely* case is a prime example of bad communication, a patent agent who didn't ask the right ... questions ... It is not the inventor's job to look for alternatives; they're concerned with getting something that works... It's the job of the patent agent to ask for clarification."

The inventor comes in a variety of shapes and sizes and also has varying levels of technical expertise, communication skills and, most importantly according to those interviewed, varying levels of experience in the patenting game. However, a common complaint, applied across the board, was that prospective patentees tended to be very narrow-minded.

> "The trouble is that most inventors only see one tree and it's the patent attorney's job to define the wood, or at least the species of tree, if not the genus that the species lies in. It all depends on how new it all is, if it's the first tree that anybody's ever seen and nothing other than a cabbage has been known before then you could have a pretty broad claim. But if it is some minor variant of black maple then that's what you're going to get – I mean you couldn't, but you know what I mean."

This criticism is "equally applicable to the big players as it is to the smaller concern," said one of those interviewed. He continued, "there are some people that I've known for years that still come in here and say "We've invented this, here's how it works." And I ask them if it would work if we changed this bit here or that bit there and they look up with a puzzled expression and say "We've invented this and here's how it works.""

One of the skills of the patent attorney is therefore to break the inventor out of this immutability of focus and to get them to generalise their invention as much as possible. They must then shape the inventive concept behind the embodiment into something that can be accorded legal protection and, therefore, should question everything that the inventor tells them:

> "I think the way that the patent agent should go about it is that he should cross question the inventor hard and you will usually find that when you say to him "what might a competitor do when he sees this, how would he avoid your patent, could he do this or could he do that?" The inventor, being fixed, only having seen this way of doing things will have great difficulty and will be inclined to say "well, nobody would want to do it that way" and you would have great difficulty in persuading the inventor that you ought to include other variations... You must remember that you're dealing with human beings, and that is a great part of it."

However, sometimes the answers that are received are not exactly what the attorney is looking for.

A Breakdown of Communication

The communication skills of scientists were, in general, treated with disdain. Whilst it was accepted that standards varied greatly from person to person, the following general comments were made.

> "Scientists have one major failure in that they tend to equate expertise with a close progression down a very narrow avenue, they use the most up to date jargon and acronyms that mean little or nothing to the rest of humanity. The very worst at this are the microbiologists whose whole language is made up of abbreviations, acronyms and shorthand – it's almost as if they think that they will appear more intelligent if they can encode what they are doing so that no-one outside of their circle can understand. The simplicity of a lot of what they are doing is often concealed within their abbreviations."

> "Scientists, as a whole, seem little interested in communicating with people outside of their profession and so make no effort to do so – have you ever tried to read a scientific journal? It's usually impenetrable. If you then compare that attitude with the function of a patent and the number of people that you need to communicate with then the tension is obvious. A patent in the general run of things is designed to be understood by the Patent Office in examination, by other patent agents should the need arise, by licensees/assignees, and by lawyers and judges. A patent agent must take all of the technical bunkum that you are fed by the inventor and reproduce it in a comprehensible form."

The problem of technical jargon is lessened by the fact that the patent specification is taken to be addressed to the skilled addressee – the person of ordinary skill in the art – therefore a certain degree of knowledge of the technical field and language used within it is taken for granted. However, a point that according to one "cannot be over-stressed" is that if the patent attorney is unable to understand the explanation of the invention that the inventor gives him then he is at a loss to be able to adequately describe it in the specification or to claim it. Another noted that the idea of the skilled addressee is, at best, a familiar fiction, for:

> "[Whilst] you're not addressing ... [the specification] to the idiot drafting it or to a person who knows nothing, you're not really addressing it to a hypothetical person who works in that field and who knows how it goes either. The true answer of who a specification's aimed at, of course, is that it is addressed to a judge on the third day of a trial, when he's usually already come to his decision and is bored to tears of the whole show."

Therefore, the simplicity with which the inventor can relate their invention to the patent attorney is vitally important to the production of a strong patent.

> "You have to be very careful, especially when you're starting out, because the skilled addressee that you have in mind might not be the same as the skilled addressee that the Court, or even your Partner has in mind, and it can change how much you need to put in [the document]."

A number of those questioned said that the ease with which they were able to extract the information required from the inventor found direct correlation with the technical field within which the invention lies.

> "[G]etting information from... [computer programmers] is like pulling teeth from hens, impossible. The reason that it is so difficult to do this is that the programs that they write grow under their fingers. They don't, by and large, plan exactly what they are going to do, they have some aim in mind, but that might change by the time the thing goes into the marketplace. The process is inherently iterative, something doesn't work so they move on, if it does work then it might lead them in another direction, there isn't, in general, any plan until you ask then to write one for you, and even then it's not usually up to much."

> "... [B]iotechnologists are definitely the worst, their reports are scant, their methods iterative and their language bizarre. The problem is compounded when you realise that it is generally the case that the people who actually find the sequences are not the ones who know how to deal with them. The way that they deal with the problem if they come and see you is to pretend that the actual introduction technique is something that everyone knows, often they don't know themselves, they expect you to do the understanding for them."

In the 'traditional' engineering fields where the invention itself could be relatively easily reduced to plan form, whether by way of technical drawing or electronic circuit, the problems associated with the extraction of the relevant information were:

> "... [I]ndisputably less... [T]he inventor has a prop, you see, and I can ask him questions about this or that and can see what he's referring to. It makes the whole process far more straightforward – it's amazing what a scrap of paper can do for an explanation."

The chemical and pharmaceutical industries also gained praise, those questioned suggesting that they "usually make quite good reports", and besides, they "keep good lab books". The reasons advanced for the distinction between general chemists and pharmacists and those in the field of biotechnology were mainly based on the relative youth of the biotech industry.

> "Of course, chemical and pharmaceutical companies have been doing this sort of thing for a long time, they know the procedure, they know what they want and how to get it... [B]iotech has really taken off in the last few years, and that's one of its main problems."

Some were slightly more scathing:

> "It's the biotech boys that think they're God's gift at the moment because they know some words that the rest of us don't, and because they can make the papers

> with a bloody sheep... It's better now than it used to be though, we understand a lot more of how things work and why they work than we used to... if you look at some of the old cases it was pretty much hit-and-run – and people are amazed when their patents are too broad and not supported or whatever!"

The 'throw-away' comment at the end of this statement is a telling point, which can be expanded to cover all forms of technology. One of the consequences of a lack of knowledge is that it will generally lead to a broader claim than would otherwise be created, therefore opening the patent up to the prospect of invalidity by anticipation or lack of support in the disclosure. This, again, relates back to the fact that it is far easier to narrow the scope of a patent in this country than it is to enlarge it.

> "Drafting [a claim] is always a matter of keeping your options open as much as possible when you don't have all of the information – you don't always have the information about the prior art, you don't have the information about what your client's ultimately going to market, and in many cases you don't have the information on which of the things he presents you with is best."

> "[Our] primary concern is not being too narrow and, well, making sure you understand how it works... So you define it in terms of what it is or how it's done as broadly as you can – which covers all the species in that genus, excludes things which you already know to be old or which don't work... [and] that's made all the more difficult if you don't know which bits don't work, ... if you don't have all of the information."

This may go some way to explain the perceived problem of broad claiming in the biotech industry.

The Peculiar Problem of the Prior Art

Inexorably linked with the issues of timing and extraction of information is the problem posed by the prior art. Since the enactment of the *Statute of Monopolies* it has been expressly forbidden to grant a patent for an invention that is not new, such a grant being an 'odious monopoly' and therefore 'without the law'.[13] The ill-timed emergence of prior art material is the cause of many a headache for the patent drafter and patentee alike. Therefore, the discovery of submerged pieces of prior art is of the utmost importance to the claim drafter.

> "A lot [of how wide you decide to draft] depends on context, the context of the prior art, I mean just how different is the invention from what was known before?

[13] This comes from Coke's famous quote that such monopolies were "ever without the law, but never without friends". Coke, *Part III of the Institutes of the Laws of England*, (1817; Clarke & Sons, London; reprint) at 182.

> If it's very different then you ought to be able to have something broader than if it's a minor variation on a known thing."

The reader will appreciate that the prior art impacts from the point of view of obviousness as well as novelty; however, it would appear that this is less of a concern to the patent attorney.

> "Novelty is the key. I would say that unless you're doing an exam you're not terribly bothered about inventive step – it's such a subjective thing, you don't really want to restrict the claim because of perceived doubts about inventive step too early, it's something you can always do in prosecution... [But] you will always try to draft a claim that is novel of the prior art that you're aware of."

At the time that the patent is drafted there are two states of knowledge of the prior art that the patent attorney may have; they either know nothing or they know something, omniscience is an impossible dream. The amount of prior art that is known to the patent attorney will depend on the time available to conduct a private search, and the willingness of the client to pay for one.

> "[Whether you've searched it or not] depends on the client's strategy ... whether they want something filed tomorrow because they think that there's a competitor around, or if they're willing to wait for a few weeks for the search results and you can write something a bit better."

If a search hasn't been done then the patent attorney is effectively shooting in the dark, where this is the case it is deemed prudent to cover the invention, as far as it is known, with a broad initial claim and many sub-claims to act as fallback positions.

> "A lot of clients really haven't got a clue; they don't know what's happened other than in their own heads, or their own laboratories, or their own garden sheds or wherever they're inventing things. If they don't want to pay for any searching up front it's a fairly hit-and-miss approach as to whether what I put together in terms of defining the invention comes anywhere near being novel and inventive, or not. Very often it's not, very often it needs to be restricted quite considerably. But in those circumstances if I were to define the invention in narrow terms so as to make sure it stands up I would be losing out on a lot of protection that the client deserves to get."

Thus, it would appear that the secret of a good specification is leeway. Room to manoeuvre in prosecution combined with a structurally sound framework is of vital importance to ensure, as much as is possible, the integrity of the patent. By provisioning fallback positions, even if one of the claims falls in examination or litigation some degree of protection may still be afforded by the others.

Knowledge of the prior art is one of the areas in which the patentee with larger financial muscles will generally have an advantage over less affluent inventors. Well-established patentees, now usually associated with research and development labs of large corporations, will probably have significant past experience in dealing with patents and, it was suggested, are more likely to be aware of the relevant prior art. Such an entity will:

> "[U]sually have documentation available to let [the patent agent] have the most relevant materials. They'll be able to see for themselves, more or less, the direction in which the invention is going and will be able to draft a protoclaim; a statement that defines the invention in their terms from which I can then work. That's obviously a good situation from my point of view because they've done some of the background searching; they know the direction in which they're headed. All I have to do then is check the prior art documents that they've sent me to see that the claim isn't ridiculously broad. That being said, it isn't always best to produce a claim of the scope that I expect to succeed at that stage because it's always good practice to have a search conducted by the patent office on a slightly broader basis than the protection I desire would suggest – in other words to try and get them to draw prior art out of the woodwork. So slightly too broad a claim at this point is better than one that is slightly too narrow."

Simple economics dictates that larger corporations will have less of a problem paying a few thousand pounds for a comprehensive search than a smaller entity would. Indeed, such expense may place the search out of the reach of many small enterprises, a risky patent with a chance of success being far more valuable than no patent at all. The gamble inherent in deciding against having a private search done is not, however, as great as it first appears. As one interviewee candidly stated:

> "[S]earching is very much a black art. If you find something, you know you've found it, if you don't find it then you probably weren't looking in the right place, it doesn't mean there's nothing there. If you just have a quick look then you've probably spent all that is justified by the position ... bearing in mind at this point you still don't know whether the invention is ever going to make it to market so why spend a lot of money on it?"

This being said, the reliability and efficiency of the searching process has undergone a revolution in recent years due to increasing amounts of information available on the internet. The cost of searching has been dramatically reduced and the probability of finding what you are after has risen in equal amounts. The European and the US Patent Offices now have comprehensive online patent databases, which enable the attorney to perform keyword searches in a fraction of the time in which a title search could have been performed in the past. There was universal praise for this advance in the speed of data recovery.

> "[N]o one really likes doing the searching for a patent application, but you tend to do a small one just in case, so what you submit doesn't look too stupid. However, clients are often not very willing to pay for anything other than a quick look. Three or four years ago even a quick look was very difficult, now you type in three or four words and 'bingo', there you are."

If items of prior art are known they can be relatively easily dealt with by amending the claims so that they no longer cover the offending subject matter. However, sometimes the patent attorney will choose to deliberately claim the prior art, making sure that they have narrower claims on which they can fall back when objection arises.

> "Maybe you'll write a claim which is drawing something that you're pretty sure is obvious or not novel because you've had a search done – but you'll write another sub-claim that you know you're pretty sure isn't; or you have a claim that that you think might be a bit dodgy so you write another one claiming the obvious and retreat from it in an examination – give the examiner his pound of flesh."

If no private search is conducted, the earliest that the patentee and patent attorney may learn about anticipations and possible novelty destroying disclosures will be after filing when the Patent Office conducts its own search.

A number of interviewees took issue with the efficacy, efficiency, and value of Patent Office searches, suggesting that in the majority of cases they were a waste of time.

> "In my experience although the process of examining in the patent office might weed out the very weak things – because there's a limited amount of time and effort that you can put into the searching and examination – essentially, it's only when you start getting into litigation that people start performing really thorough searches, and then you find out what the true previous things are because you dig much more deeply."

> "[T]here's a strong argument that can be made for having no searches and no examination as in the old French system where you just filed it and let the world sort it out... There's nothing scientific about the searching business, it's very much a hit and miss procedure most of the time... [However], there's a direct correlation between the amount of money you throw at a search and the results that you find. It leads to a very uneven playing field."

Thus, the intrinsic scope of the patent specification can be directly linked to a number of things. These include, the purpose for which the patent is desired, the knowledge that the attorney has about the way in which the invention works, the amount of time she has to draft the thing, and the degree of knowledge, and proximity, of the prior art. Patent attorneys regularly draft claims with purposeful imprecision to enable them to cut back and prune the monopoly should esoteric pieces of prior art materialise. They

play games and play the system to get their clients what they want, and this is not always a monopoly. It is hardly surprising, therefore, that a great deal of the patents on the register probably are, in fact, invalid. This conclusion is further reinforced when the 'nuts and bolts' of the drafting process are considered, and it is to this topic that we now direct our attention.

The Drafting of the Specification

The patent specification is of vital importance to the scope of the monopoly that a patent commands. As already stated, the claims not only define the invention, but also determine how far the penumbra of the patentee's monopoly should be allowed to extend. It may therefore surprise the reader to learn that the total amount of time spent drafting and refining the specification, including technical time spent before the Patent Office, typically amounts to a figure of between ten and thirty hours.[14] The time spent on drafting the claims – the defining feature of the patent – is approximately 30 per cent of this total. Some of the attorneys that took part in the survey stated that they expected to write[15] something in the order of two hundred specifications a year. When these figures are considered along with the non-traditional, commercial reasons for obtaining a patent it is easy to see that there may be some truth in the old saying that 90% of patents on the register are invalid.

There is no set way to begin to draft a patent specification. Some of those interviewed stated that they like to start with the description to focus their minds; others said that the claims came first; some liked to build up from the specific embodiment and some liked to chip away from the general idea. Whatever the approach, there are a number of common factors in the way that the process of creation proceeds:

> "[Y]ou can't simply put it down on paper, you go backward and forwards, backward and forwards, backward and forwards ... Your thoughts are likely to change during the drafting, but the thing that I've learnt is that you have to start, you have to put something down, if you don't put something down, you never get anywhere. So even if it's rubbish you must put something down, and then you toy with it, and out of that you develop what is hopefully a useful specification."

> "[O]ur minds ... go backwards and forwards. You ask if the claim as drafted covers something ridiculous, and if it does you reduce it in scope a bit. The eventual

[14] None of those interviewed gave figures greater that 30 hours for a 'typical' application.

[15] Or redraft and file if the specification arrived via a PCT application for introduction into the European market.

aim is to try and reach a delicate compromise between what is too greedy and what is sensible and what will stand up in court. So I don't think that you can just sit down and draft a patent specification, it takes lots of going backwards and forwards, of carving and refining."

"The first step is to look at the invention and to try and define it, basically with reference only to the invention... [H]aving got this very woolly definition down on paper, it's a matter of analysing it phrase by phrase, group of phrases by group of phrases to see whether there are any unwanted interpretations, meanings, ambiguities, whatever. Then, having got an internally consistent definition I'd compare that with the prior art documents of which I'm aware, usually provided by the client, and if they suggested a change in direction, a restriction of scope, or whatever then I would implement that. It's an iterative process... The next stage after prior art, it's probably going back over the terminology in the claims making sure that I've not used a word which the prior art generally tells me means something different in that technology, or whatever."

The process of patent claiming was compared to sculpture; "whether you work in granite or bronze, whether you build up or chisel down, the process is broadly the same," you are constantly refining the structure, constantly redefining the fascia. Occasionally the subject matter will dictate the approach, but the end product will have the same volume whichever way you work. The important thing is to retrace your steps, to deconstruct and interpret as you construct and define.

"[The primary concern is to create a technical definition, a secondary concern is to] try and find language that is appropriate to [get it through the Patent Office]. There are tricks of the trade that are sometimes used here. But getting it right ... it has to be new and it has to be inventive, to have inventive height as they sometimes call it, often you can't take a view on that because you don't always know what the prior art is. You take a fly, you draft broadly, you put in lots of fallback positions – that's terribly important, it's no use drafting it terribly broadly and then showing one or two specific embodiments because there's nothing to fall back on. If the broad is too broad, where do you go? Right down to narrow, to the specifics, and what good is that?"

"[I]t makes it easier if you know what's out there because you know what you can get away with and what you can't. It also allows you to write the description so that the examiner thinks that it's clever when it might not be, or at least it appears cleverer than it is... [Y]ou should write your description and your introductory paragraphs of the specification and dress them up so that the examiner gets to the end and thinks how clever it is. It might well be very inventive, it doesn't have to be subterfuge ... but on the other hand, you can... dress mutton up as lamb in the same way, it's no different. It's a game. It's just a matter of telling the story."

The intrinsic scope of the patent is dependent upon a whole host of factors, but at the end of the day, tricks of the trade or no, the patent attorney can only provision for the equivalents that she can think of.

Therefore, we now turn to address the question of whether those interviewed thought that any degree of latitude should be given to the interpretation of the patent if, and when, it gets litigated.

Literal or Liberal Interpretation?

It is at this point that the attorneys interviewed split into two distinct factions. One group hold what I shall be calling the 'traditional' view; that the patent is defined by its claims and that these should, in the interests of certainty (and ease of drafting subsequent patents), be construed more-or-less literally. The other group holds the 'liberal view'; that the patentee should benefit from having disclosed their invention to the world, and should not be judged according to the depth of their pockets. Interpretation should, first and foremost, be concerned with fairness to the inventor as they have chosen to lay their invention open to the scrutiny of the world in return for a temporary grant of monopoly power.

The Traditional View

The traditional view states that the claims are the focus of the patent, they are the words and phrases that define the legal monopoly being sought. They are of no-one's choosing other than the patentee and the patent attorney, and once the patent has been agreed upon no leeway should be given. To interpret the claims in a more liberal sense than their literal meaning is to give the patentee something that they have not asked for:

> "[The claims] are the definition of the legal monopoly that you seek, so you are required to define them definitively... If something is outside of your claims then you haven't claimed it... A lot of the things that go to court are very much "oh well, I haven't claimed it, can I have it? Please sir, I meant to claim it, honest." ... [Now], quite often they don't get it, but there's so much money at stake that they have to try – their shareholders expect it... [Y]ou have to remember that with a lot of cases; the stakes are so big that you have to fight even if the chance of winning are quite small."

Most of those questioned stated that even the current tradition of giving a purposive construction to the claims of a patent was going too far.

> "If you don't agree that whatever isn't claimed is disclaimed[16] then you're really saying that whatever isn't claimed could be claimed but we'll argue about it. That road leads to lack of clarity and essentially removes the need to claim in the first place – if you're not bound by what you say. Essentially all the requirements in law, in the European Patent Convention, the rules in the High Court now are for clarity – the public needs to know where they stand. And importantly, so does the patentee – a point that is often forgotten in the quest for "fair protection", if you, yourself don't

[16] See the speech of Lord Russell in *EMI v Lissen (1939) 56 RPC 23* at 41.

know where the limits of your patent lie how is that fair? So you need to be precise, you're going to be given a massive monopoly that could be worth millions of pounds – your half of the bargain is first to produce an invention and show that it works and is useful second you have to tell the rest of the world what you claim and what you don't claim – and that's why you have claims at all. Yes, the more I think about it the more I'm firmly of the view that if it isn't claimed it's disclaimed – because otherwise where are you?"

If one follows this approach then the "only problem arises where you use very narrow and precise definition for something that oughtn't to have been narrowly and precisely defined." In such a case the patentee places the court in a potentially difficult position.

> "[If there is] a broader concept in his invention [than that claimed], and we agree that latitude will be given to the interpretation of what he has actually claimed, are we going to give him the benefit of the doubt and give him the neighbouring counties, as it were, even if he hasn't specifically asked for them? If we are then how many does he get?"

When it was pointed out that the traditional German approach was to look to the essence of the invention and to see the protection that it deserved utilising the claims as a guide and that this appeared to function adequately, the reply was stock:

> "Ah, but I've seen German cases where the patentee has got away with blue murder."
>
> "Allowing a bit of latitude may be OK, but not that much, and damn right, the public needs to know where it stands."

They continued, reasoning that a patent is not a God given right. It is only a right under the terms of the Patents Act.

> "You don't have a divine right to a monopoly, you have to do something for it, you have to claim it, and if you claim it badly and you don't ask for the right thing, well *caveat applicant* if you like. I don't, myself, think that the law should fall over backwards to assist you, unless it's clear that you paid an attorney to do it and he did a bad job and it's not your fault – you'd get a bit of a following wind there, but not a lot. It's like the old saying, "if you make a wish, make sure you think very hard what you wish for". That's Arabian Nights and it's equally true today. The duty is on you to frame your wish... [If a patent is framed badly then] I don't think any of those should be more broadly defined when they got to court, they chose to define something narrowly, they needn't have – they were of sound mind when they did it. Tough. It is, after all, a contract – there's a weight on both sides."
>
> "A patent is not something that comes in the water, it's something that you are allowed to have in exchange for invention and you have to define what you want. The onus is on you to define it... It's something you have to work for – it's not sort of "all have done well and all shall have prizes." You've actually got to invent something and then the second half of the requirement is that you've got to actually define what you want, the state's not going to do it for you."

Moreover, all of those holding the traditional view stated that they were professionals who were paid a lot of money to get this aspect of their jobs right. They were covetous of their training, insisting that if you can't draft properly then you shouldn't be in the patent drafting business, a view that has certain charm. They rationalised that a lack of certainty may benefit the rich patent holder who can threaten and bully his competitor and who can easily absorb the cost of litigation, but asked if it can really be fair on the smaller enterprise not to know how far their monopoly extends. The professional view is that patents are for the big boys and that you should get what you ask for, if you don't know how to ask then that's your bad luck.

> "If you can't draft properly then you shouldn't be in the business. I take the British view of it, that this works in two ways, if you're wearing the hat of the patent holder, you want uncertainty, because that gives you effectively broader scope – particularly if you're a rich patent holder, if you're a poor patent holder, it means not a lot, but if you're a rich patent holder, yes, that uncertainty around the edge of your claim, if you can make it great enough, gives you a more powerful tool. But we must not forget that we often represent the other guy in this profession – hired guns, we shoot who we get paid to shoot – we represent both sides, we act for the patent holders or as patent busters. So ... my view is coloured by working for both sides of this..."

> "I think it is important to have certainty in areas of law, which is an old British principle. This applies particularly where someone is asking of the government the grant of a monopoly, which is a favour; they should be precise in what they're asking for. Why should the government give them something furry or fuzzy? They should be given what they ask, nothing more, nothing less, certainly nothing more. And if they can't ask properly then that's their bad luck, they're asking to be given something, their also asking for something to be taken away from other people, a freedom to do something, a freedom to act in a certain way... I think if you are asking to be granted something like that... If you get it wrong then that's your bad luck, sorry...
>
> [P]retty much everybody is represented in this game, patents are not really for private individuals unless they are really serious entrepreneurs, they're for businessmen and nobody in business (as far as I know) is foolish enough to write their own patents, they all have them done professionally – and if your patent agent makes a mistake then perhaps you should sue him. That should be your redress, if it's not a mistake and you genuinely thought that your patent was limited to what you had written in your claim then tough, why should you be entitled to come back and say "ah, but what I really meant was..." which is what it all boils down to.

Those holding the traditional view continued, saying that if nothing else their view was the safest.

> "...I think my viewpoint is the safest one because I can guarantee that even given a hard nosed interpretation I still get what I thought I would. I would never rely on some vague, broad interpretation to get me my infringer... [I]t seems to me that by doing it my way you win whichever jurisdiction you're in because we've probably got one of the hardest nosed jurisdictions in the world, so if you draft towards a British court, it'll be OK anywhere else with the local rule of interpretation."

> "The people who lose out are the Continentals because of the way they tend to draft, but they're not as bad as they used to be."

A further justification for the approach taken by those holding the traditional view was that, in their eyes, the efficacy of a patent is dependent solely upon the financial might of the patent holder. If the owner of the patent is wealthy enough then even a weak patent can be used highly effectively – 3M was a well cited example of a particularly aggressive patent holder which is likely to threaten legal action even in respect of its less sound patents. It was therefore reasoned that literal interpretation not only provides certainty for third parties, it limits the effects of big corporations like 3M throwing their weight around. However, it might also be argued that the converse is true; that more liberal interpretation might dissuade large corporations from feeling that they have to flex their muscles as much, and that returning to literal interpretation would provide them with added incentive to tread on the little people.

Whatever the justification, there is another, perhaps less popular, but nonetheless strongly held view within the profession that deserves explanation.

The Liberal View.

The liberal view reasons that the patent attorney is not, nor will ever be, perfect. It reasons that the patent specification, in its entirety, is written in between 10 and 30 hours, with perhaps a further 5 hours of technical time during its examination by the Patent Office. It considers the huge disparity between this and the amount of time that will be spent considering the documentation if the patent ever becomes litigated.

> "When that patent comes to be considered by lawyers for any reason they will spend thousands of man hours picking over it and ripping it apart, already the deck is stacked against you."

A further consideration is the relatively large[17] amount of money that is made available for the litigation of a patent compared to that committed to its filing, and the commensurate increase that this provides in the danger of attack from the prior art. It is a common sense application of mathematics that states that where an alleged infringer is threatened with damages of the order of two million pounds, it is worth spending half a million searching the prior art in order to attempt to invalidate the patent. Thus, even

[17] In some cases 'vast' may be the more appropriate word.

before the Court steps in to give the claims a its purposive construction, the odds are against the patentee.

The liberal view is that the patentee should benefit from having disclosed their invention to the world, and should not be judged according to the depth of their pockets. They answer the traditionalists and their call for literal interpretation by stating that:

> "Patents are not statutes and should not be interpreted as such. They are written relatively quickly against cost. Moreover, they are written usually by one person, we all make mistakes – you only have to look at the atrocious wording of some statutes to see that even Parliament makes mistakes. It is impossible to get it right in all cases."

> "[T]he client should benefit from having disclosed, he should then be on a level playing field with competitors. He should not gain extra benefit from having happened upon a better patent agent, or from having employed a patent agent on a particularly good day."

The court should be encouraged to look at the patent for what it is, a description of the invention. It should be encouraged to take the viewpoint that anyone in the marketplace can get the specification and ask "what are the common features between what I'm building, etc., and the patent; are they new and related to the patent or are they different?"

Counsel and the courts, it was stated, seem to take the viewpoint that to give any latitude is to adopt a position whereby you might give out a monopoly of incorrect scope, and that if this occurred it would be the end of the world. Attorneys pick up on this and tend to agree that anything other than literal interpretation encourages deviants to deprive the public of what is rightly public property. However, it was stated that in the vast majority of cases if one asks a few simple questions the problem vanishes. Besides:

> "It is often forgotten that the job of the patent agent is not to make sure that infringers can get away with infringing, the primary purpose of the agent is to protect the patentee's invention. It is also forgotten that little mistakes are so easy to make and that it is very rare for anyone to be expected to be perfect all of the time."

They reasoned that the injustice of a literal interpretative doctrine is further compounded if you take a patent document and file it abroad. The original document is produced with a certain amount of effort, and if it is taken around the world the

patentee incurs vast costs in translations alone. If the original document is then knocked out, or avoided, because of a technicality in the wording then the rest is vanity.

However, it is submitted that the current state of affairs in the United Kingdom is closer to the traditional view than to that of the liberalists. Therefore to return to a quote that has been used before:

> "[I]f you make a wish, make sure you think very hard what you wish for"

... It may come back and bite.

Conclusion

The traditional and liberal views of patent interpretation are not merely different; they are irreconcilable. They stem from different perceptions of the grant and, importantly, different perceptions of the attorney's own jobs and that of the patent system. The fact that the majority of those questioned saw themselves as potential 'double agents', one day working for one client and the next working for their competitor, is, it is submitted, a highly significant factor in the determination of the intrinsic scope of patent protection. This split allegiance necessitates (at least in the majority opinion) a minimalistic approach to the latitude that should be given to *their* wording of the claims. In addition, a fierce professional pride (that bordered on arrogance in some cases) seemed to dictate that scope should be restricted to the words as they had written them. One of those interviewed likened the drafting of a patent to the copying of a painting; it simply wasn't good enough until you could fool the experts. You couldn't claim success if they said, "well, this could be the real thing if we give it a broad enough interpretation," you have to strive for perfection.

The fact that the majority of those interviewed branded the patent grant an economic monopoly is also highly significant. The reader is reminded of the stigmatic effect of monopoly rhetoric and the boost that it gave to the abolitionists' argument during the 'Anti-Patent' debate of the late-19th century.[18] The fact that those most intimately involved with the creation of the patent, indeed those charged with shaping it in the first place and defining its literal scope, class it as a monopoly that needs to be

[18] See Chapter III, above.

contained is saddening. It demonstrates distaste for the grant and, as we shall see,[19] a misconception of the actual effects of the patent. This, in itself, is significant.

We have seen the traditional justifications of the patent system and are now in a position to answer the question of how these fit in with the commercial realities. Classical economists clearly saw the patent grant as reward or incentive, the reason for offering a patent was to enable protection from competition. In the modern sphere there has been a subtle but significant shift in the underlying reasons for patenting. The old justifications still hold true to an extent, however, there are now other motivations behind seeking the grant. These other considerations may well have far reaching effects on the intrinsic scope with which these patents are drafted. Furthermore, the amount of time devoted to the preparation of a patent, when compared to the amount of time that will be devoted to scrutinising it should it ever come to be litigated, is very small. This is necessarily the case. However, it is something that some would say should be taken into account when the claims come to be interpreted and their scope defined. This point is made all the more significant when the depth of the patentee's pockets is also considered. If the patentee is rich, then not only will they be more readily able to defend their patent should the need arise, but also they will have been able to pay for a better patent in the first place. Money is indeed the key to better patent protection. Large, well-funded entities are doubly benefited, for as well as capacious pockets, they will have the patenting 'know-how' that is so important. As noted, one of the most important things that the patentee needs to know when they are seeking a patent is *exactly* what they want, experience can only improve their chances of getting something that works.

As we have seen, the determination of the intrinsic scope of the patent is of vital importance to its final breadth of protection because the literal wording of the claims is generally considered to define the narrowest interpretation that the patent can have.[20] However, the creation of any specification is beset by myriad of obstacles and difficulties that make this task more of a 'black art' than a scientific endeavour. Indeed, such are the odds stacked against the applicant that it is amazing that any patents are ever held to be valid at all. Yet the majority of those involved in the crafting of the

[19] See Chapter V, below.

[20] However, as we shall see in Chapter VIII, below, this is not necessarily the case.

grant would still promote legal certainty over fair protection. Self-interest, it would appear, is the main reason for holding this view, as it is no doubt far easier to draft subsequent patents in the same area where one does not have to do anything more than interpret their claims in a literal manner. However, can it really be said that this narrow approach to the interpretation of claims is any more certain than an alternative 'equivalents' analysis? As many of those interviewed pointed out, the patent game is no longer one for individuals, it is a business, and in business you employ professionals, experts, to do your drafting for you. Why then, would it be so difficult to seek professional advice on the scope of a competitor's patent to see if your invention infringes? Adopting such an analysis would not encourage sloppy drafting, but may help to right the balance between the ivory tower of certainty and the much maligned outcast that is fair protection.

The sad reality of the patent system is that, as the economy has developed, it has turned into something that protects the strong at the expense of the weak. It is a matter of historical fact that the majority of groundbreaking, or pioneer, inventions have come from individuals, not from the hallowed halls of big business.[21] The economic reasoning for this is simple, big firms are led by profit, the cost/benefit ratio of a pioneer invention is uncertain, therefore the expected profit that flows from any investment in R&D associated with such an invention is highly uncertain. It makes far more economic sense to proceed down a narrowly defined path investing in R&D that forecasts say has a better than average chance of leading to profit. Put simply, accountants mean that big firms are highly unlikely to be responsible for the most spectacular technical contributions, unless serendipitously stumbled upon.[22]

Discussing realities before considering the post-classical economic theories and the 'hard' economics of the patent system may seem like putting the cart before the horse. However, this is not so. The foregoing discussion provides the reader with specific context in which to critically evaluate the following Chapter. It will allow the reader to question the validity of the theories advanced and to note, in the light of practical

---

[21] For example, Morse's telegraphy patent, Watt's steam engine patent, Selden's horse-less carriage patent, etc. See further, notes 39 to 42 in Chapter VI, below.

[22] It should, however, be noted that initiatives such as the establishment of University I.P. centres may be one potential answer to this conundrum.

examples, where they depart company with fact. Therefore, we now turn our attention to the hard economics of demand, cost, and price, as well as the post-classical economic theory; and ask whether a patent can actually be described as a monopoly?

CHAPTER V

Patents Within the Market Economy

Part Three

–

Basic 'Hard' Economic Theory, Post-Classical Justifications & Theories of Protection

Some Basics of Economic Analysis

In order to understand the value of the patent grant, and modern economic modelling of patent scope, it is necessary to understand the economic effects that a patent has on the marketplace. Therefore, before proceeding to discuss the issue of value within the market economy, we take a little time to examine some of the basic concepts underlying this economic analysis and to define a number of key terms.

The principles stated can be found in any good basic economics text. Posner, *Economic Analysis of Law*[1] and Baxter, *Legal Restrictions on Exploitation of the Patent Monopoly: An Economic Analysis*,[2] have been extensively utilised by the author in the preparation of the following.

Demand and Price

The starting point in our economic exploration of the patent system is the inverse relationship between price and demand. Put simply, if the price rises then, in general, demand for the product or service will fall, and vice-versa. This is demonstrated in *figure 1* (below). Here the y-axis represents price (£) and the x-axis is the quantity of the item supplied in unit time (Q/t). The downward sloping line is the demand curve for the product.

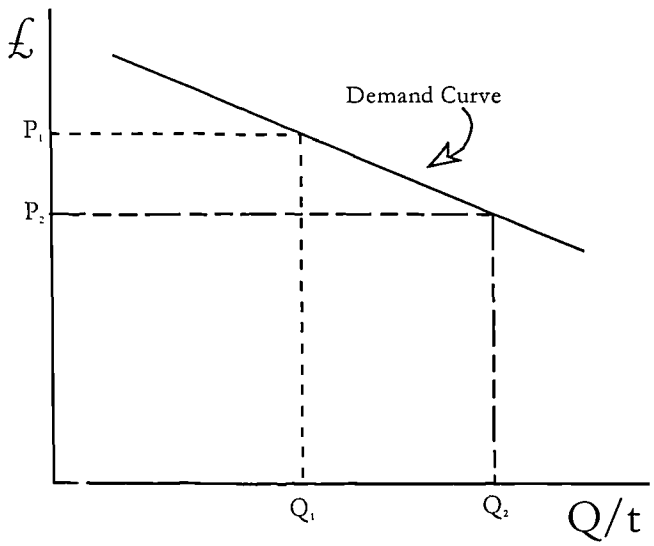

Figure 1: The Demand Curve

[1] (1992; Little, Brown & Co., Boston; 4th Ed.).

[2] *(1966) 76 Yale L J 267*.

The reason that the demand curve slopes down and to the right is twofold. First, as the price falls some consumers that would only buy a small number of units at the higher price will now buy more. Second, there will be some consumers that will buy no units at high prices but who will buy some units when the price is lower. If we take a simple example to illustrate this and imagine an island (as a closed system) on which there is one shop. It sells apples and pears and these are the only food items available on the island. The price of apples is £1 per kilogram and the shop sells 10 kg per day. The consumers that buy apples value them at £1 per kilogram or more, at this price the pear is a poor substitute. If the shopkeeper raises the price of apples to £1.50 per kilogram, many consumers will continue to buy apples as they did before, however, some consumers will reduce the amount of apples that they purchase and buy pears instead. The quantity of apples demanded by the consumers, and therefore the amount produced, will fall.

This example is necessarily simplistic and assumes that the only things changing in the system are the relative price of the goods and the quantity demanded. It ignores other factors that might impact on the sale of apples; such as other shops opening, the quality of the apples falling, fluctuations in the income of the consumer, etc.

Elasticity

The value that the consumer places on the goods (i.e. the need, or desire, that they have for them), combined with the substitutability of other products will affect the slope of this curve. The slope of the curve at any given point is referred to as its elasticity. This is a measure of the rate of change of quantity with respect to price. It is calculated by comparing the percentage change in quantity brought about by a percentage change in price. The higher the elasticity, the greater the impact that a given price movement will have on the quantity demanded. Where the slope of the demand curve at a given point is greater than one, the curve is said to be elastic, where it is less than one it is inelastic, and at exactly one it is said to be of unitary elasticity.

If we consider the example of apples and pears once more we can see why this is the case. If we suppose that the population of the island like apples, but really dislike pears and will only eat them if there is no other alternative, it will take a very large increase in the price of apples to affect the quantity demanded as the alternative (buying pears or going hungry) is a poor substitute. Here the curve is inelastic. If, however, the

substitutes are more acceptable then the slope of the demand curve will be shallower as people will more readily replace apples with pears when the price rises too high.

The elasticity of the curve at any given point can be described by the mathematical formula:

$$E_q = -p/q \, dq/dp$$

Where p is the price, q is the quantity demanded at that price and dq/dp is the inverse of the gradient of the demand curve.

The Demand Curve under Competition

The demand curve illustrated above is that for the product, in our example for apples. It will also be the demand curve that the seller will face where the seller is in a monopoly position and is the only outlet for the product. Where the seller has competition, she will obviously have to share the market and sell only a fraction of the total quantity of goods at any given price. The introduction of competition will mean that the demand curve that the seller faces will usually be slightly more complicated than that of the total demand for the product. This is because another factor enters the equation – substitutability of supply. If we return to our island, we can see the effect of this extra complication if we introduce another shop next door to the first. Now, there are two shops selling apples and pears. If the price of apples rises in one shop only (assuming all other variables are constant) then consumers, rather than substituting pears, will simply turn to the other supplier (the fact that it is next door means that we can factor out any costs associated with travelling to the other shop).

Therefore, the demand curve facing the seller of the product will lie to the left of the demand curve for the product (as the seller has to share the market, the quantity demanded will be less than the total quantity). In addition, it will usually be more elastic, at least for prices higher than the current market price. The reason for this qualification comes from the fact that the other sellers in the market may learn of the reduction in price and therefore also lower their prices. It is tacitly assumed that other suppliers would not respond in a similar fashion to an increase in price,[3] as they could catch an increased market share by simply selling at current price. Where the seller

[3] As long as it is not caused by an increase in cost that they all experience.

reduces the price of the product and the competition follows, they will not increase their share of the market. They will, however, sell more units in line with the demand curve for the product.

In any given market, the slope of the demand curve for our hypothetical seller will primarily depend on two factors: the first is the demand curve for the product, and the second is the number of other sellers in the market. Where the seller is a monopolist, the demand curve that they face will be the same as the demand curve for the product itself. Where there are a small number of firms competing, such that the conduct of each firm significantly affects the situation of the other firms,[4] then the demand curve faced by each may look something like that in *figure 2* (below).

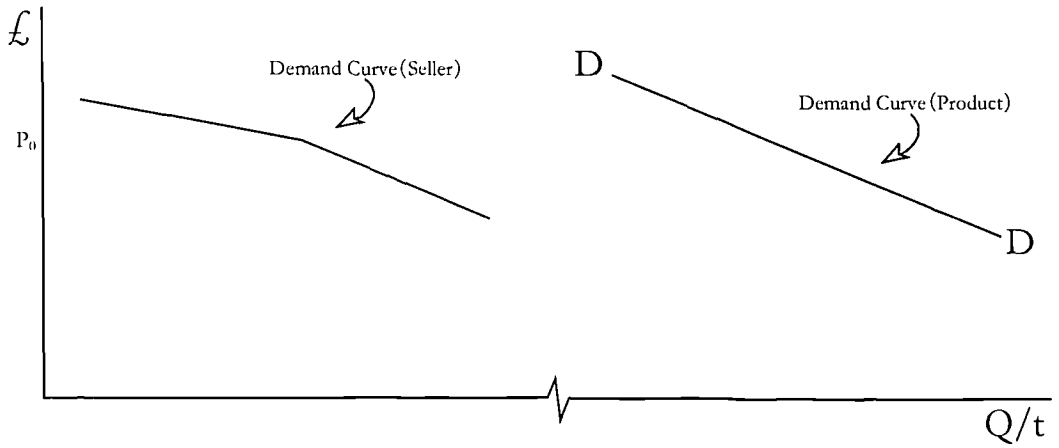

Figure 2: Oligopolistic Competition

The kink in the curve occurs at the existing price (P_0), below which the market is assumed to respond to a reduction of price by similarly lowering prices, therefore the slope roughly parallels that of the demand curve for the product. Where the price is raised the market is expected, for the reasons outlined above, not to respond in a similar way, therefore the curve is more flattened.

As more sellers enter the marketplace the oligopolistic interdependencies between them are softened, as the effects of competition diminish the impact that a price change by one seller has on the rest of the market. Where the market is not perfectly competitive, either because the number of sellers is too small or because the product is not

[4] This is known as an oligopolistic industry.

homogeneous, the demand curve faced by the seller may look something like that in *figure 3* (below).

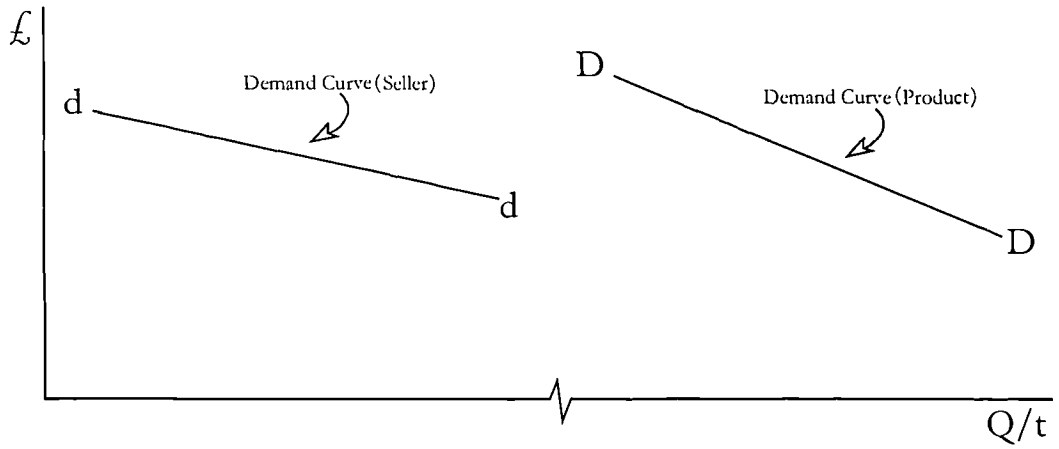

Figure 3: Imperfect Competition

Where the market is in perfect competition - i.e. the goods of one seller are perfectly substitutable for the goods of another, and there are many separate sellers, each with small market share – the demand curve for each seller would look like that in *figure 4* (below). Here the demand curve is flat, the elasticity is infinite; such a system is said to be perfectly elastic. The seller in this scenario can sell all that he produces at the existing price and nothing at higher prices, as customers would simply go elsewhere. It is apparent that the seller in our example will wish to trade at the price that maximises their profit – the difference between their costs and their sales revenue. However, under perfect competition at every point up to the lowest profitable price the seller faces the prospect of being undercut and therefore losing sales.

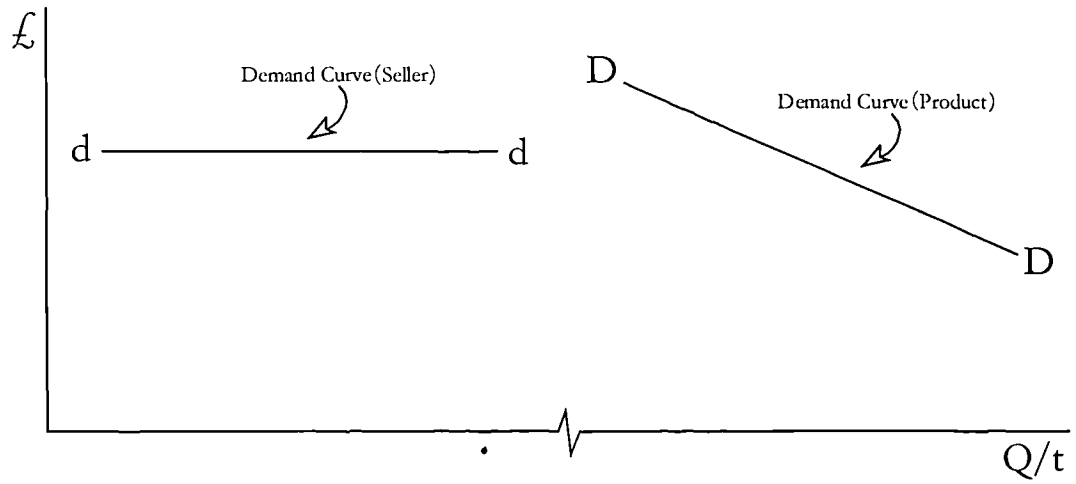

Figure 4: Perfect Competition

Marginal Revenue

Another useful concept employed by economists is the "marginal revenue curve". This is the curve that can be drawn for any given demand curve that represents the net effect on revenues of making ever-larger numbers of sales. If we turn, once more, to our island example we can see a practical illustration of this principle.

Imagine, once again, that there is only one shop on the island, it sells apples and pears. The highest price the shopkeeper can charge for apples is £1 each, however at this price he only sells one per day – this is the unit price. If the shopkeeper drops the price to 95 pence per apple then he sells two per day[5] – this is the two-unit price. However, the sale of two apples at 95 pence is less than the sum of the unit price and the two-unit price (i.e. 95p + 95p is less than £1 + 95p). Here the marginal return is 90 pence (i.e. 95p + 95p - £1). If the shopkeeper wishes to sell three apples he must again reduce the price. The return to revenue as a result of the last (marginal) sale will always be less than the price at which the last sale was made.

If the marginal revenue curve is sketched, a number of points become apparent. First, it will always lie below the demand curve for a product at every quantity after the first unit (at least where the demand curve is not perfectly elastic. Where the demand is perfectly elastic the marginal revenue curve will be incidental with the demand curve as every unit produced can be sold at the prevailing price). Second, the marginal revenue curve will, itself, slope downwards for as long as the demand curve follows a linear descent. Third, the marginal revenue curve will hit the x-axis at the point of unitary elasticity and will then fall below it (i.e. the marginal revenue will become negative), as the curve becomes inelastic. This occurs because, after the point of unitary elasticity, it is necessary to cut the price by more than one-percent in order to gain a one-percent increase in quantity sold.

This principle is best illustrated by example. Therefore, suppose that the demand curve for apples in the shop looks like that shown in *Figure 5* (below) and our shopkeeper can sell four apples per day if he prices them at sixty pence each. The revenue he gets from the sale is £2.40 (i.e. 4×60p). If he drops the price to 50 pence each, he can sell 5 apples

[5] The demand curve slopes downwards to the right, therefore in order to sell more units the price must drop

a day. The revenue that he will get from the sales at this new price is £2.50 (i.e. 5×50p). Therefore the marginal return in moving from four to five apples per day is 10p (£2.50-£2.40). If our shopkeeper wishes to sell 6 apples per day he has to drop the price to 40 pence. The revenue he gets from the sale of six apples is 6×40p = £2.40, i.e. less than the revenue that he gained from selling five apples at 50p each. The curve at the six-apple price is inelastic. The marginal revenue that accrues from moving between sales of five apples at 50p each and six apples at 40p each is negative. The shopkeeper loses money by dropping the price to this level. This is an example of the law of diminishing returns.

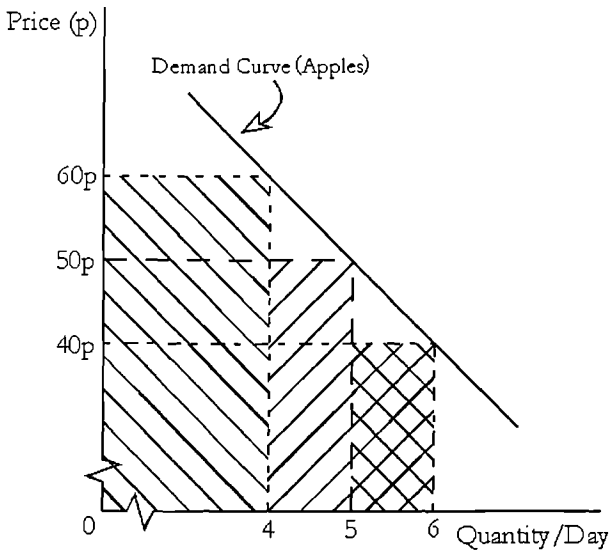

Figure 5: Marginal Revenue Example

Cost

It should now be apparent to the reader that the demand curve for any given product is of vital importance to the seller or producer of that product, as it will dictate how, and when, the sale of the product will be profitable. However, this is not the end of the story for there is another factor, of equal importance to demand, that affects the market of a product: Cost.

The interrelation between the demand and cost curves for a given product provides information on the level of production that will take best economic advantage of the situation.

The lowest profitable price in any situation will be the price that the resources consumed in the production and sale of the item would command in their next best use.

This is the price that economists refer to as the 'opportunity cost'. For example, assume our shopkeeper has a small piece of land that is lying unused. He decides to start growing lettuce on the land to sell in the shop. The opportunity cost of the lettuce will be the price that the labour, materials and transport, etc. involved in bringing it to the point of sale would have commanded if sold to the next highest bidder. This is because the producer must have outbid their nearest rival to obtain the resources. However, importantly, it will not include the purchase of the land, as this is a sunk (or incurred) cost at the time that production is contemplated and commenced. The shopkeeper already has the land, it is lying unused and therefore will not (assuming that he is rational) factor in the price he charges for his lettuce. To take another example, if it cost £10 to assemble a widget, but now that it is assembled the most that it can be sold for is £1, the fact that it cost £10 to build should not affect the sale price, as selling at the lower price is preferable to not selling at all.

A consequence of defining 'cost' as 'the value of the resource in its next best use' is that cost will only be incurred when someone is denied the use of a resource. This definition means that those resources that can be classified as free goods (goods not exhausted by use) are, in fact, costless. A commonly quoted example of this concept is the air that we breathe. Air is costless as one can breathe as mush as one wishes without depriving anyone else of the air that they want. There is no 'economy' of air as there is no next best use, because one cannot, under normal circumstances, be denied use of the resource. This has important implications for the patent system that will be explored below.

For expediency economists often divide the total cost for the production of a particular item into two elements. The first is fixed cost. This is, by definition, the same for all levels of output available within the seller's normal operating range (i.e. given their current premises and contractual obligations). The second is variable cost, which rises and falls according to the level of output. Costs may be described in aggregate, or per unit, depending on which is more helpful for any given purpose. Aggregate variable costs will generally rise as production output increases. The total cost of production is calculated by adding the aggregate variable cost at any given point to the fixed cost. An illustration of possible fixed cost (FC), aggregate variable cost (VC), and total cost (TC) curves is given in *Figure 6* (below).

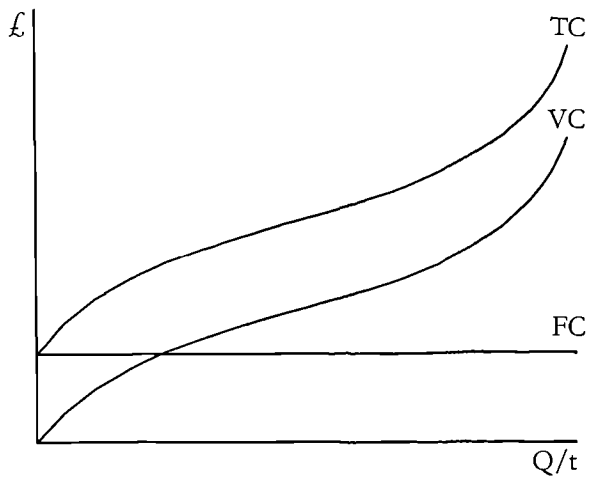

Figure 6: Cost Curves

The average variable cost (variable cost per unit) (AVC), average fixed cost (AFC), and average total cost (ATC) are calculated by dividing each category by the number of units of output for any given cost. An illustration of possible average cost curves is given in *Figure 7* (below)

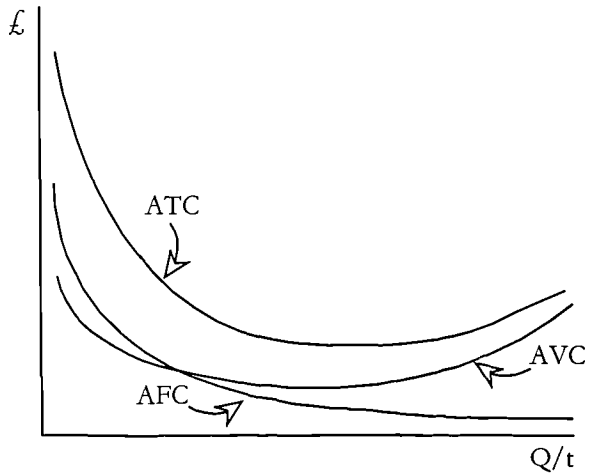

Figure 7: Average Cost Curves

In much the same way as we calculated the marginal revenue curve from the demand curve earlier, it is possible (and very useful) to calculate a marginal cost curve. The marginal cost is the additional amount of cost associated with each successive unit of product, or, put another way, it is the cost avoided by producing one unit less. Given that fixed costs are, by definition, the same for all levels of output within the normal operating range, the marginal cost will be attributable to changes in the variable cost and will bear close relationship to the average variable cost curve.

Just as the marginal revenue and demand curves coincided at unitary production, the marginal cost curve at this level of output will be incidental with the average variable

cost curve and the total variable cost curve.[6] For as long as the incremental cost of producing another unit of product is less than the incremental cost of producing the last unit, the marginal cost and the average variable cost will both fall. Additionally, as the marginal cost curve is, by definition, not affected by the higher incremental costs of producing earlier units, but the average variable cost curve is, the average cost will be greater than the marginal cost. At the point at which the cost of making an additional unit ceases to be less than the incremental cost of making the unit before, the marginal cost curve will reach its minimum. It will still be below the average cost. However, for successive units it will now start to rise, whereas the average cost will continue to fall. Where the incremental cost of producing another unit exceeds the average cost of producing all of the units before it, the average variable cost curve will find its minimum. This will occur where the marginal cost curve intersects the average variable cost curve. The marginal cost will always be more than the average variable cost where the latter is rising, and less where it is falling. See *Figure 8* (below) for graphical representation of this point.

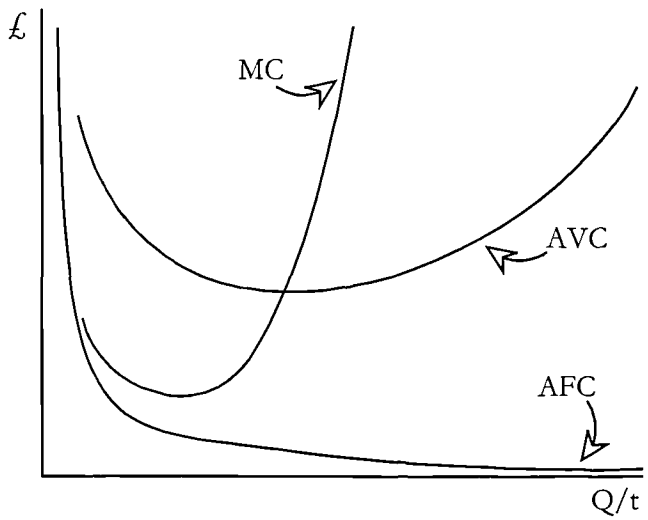

Figure 8: Marginal Cost, Average Variable Cost and Average Fixed Cost Curves

Profit

The motivating factor of all economic behaviour is assumed to be profit maximisation. If the cost and demand curves for any given period are superimposed then it is possible to see that profit may be maximised if operation proceeds at the level where marginal cost is equal to marginal revenue. This is because failure to produce a unit whose

[6] It is simple to see why this is the case, the marginal cost of moving from no units to one unit of production will obviously be equal to the cost of the first unit.

incremental cost was less than the incremental revenue that its sale would bring would not be consistent with the purpose of maximising profit. Similarly, it would not maximise profits to produce an additional unit where the incremental cost of production was more than the incremental return to revenue that its sale would bring.

If, for simplicity's sake, we assume that the marginal cost (and therefore the average variable cost) for a particular product is constant, then we might see a situation such as that represented in *Figure 9* (below). The firm, under imperfect competition, will wish to maximise its profits and therefore produce quantity Q, the quantity that corresponds to the intersection of the marginal revenue (MR) and marginal cost (MC) curves. It will sell the goods at price P, dictated by the incidence of line q with the demand curve (D). The total (gross) revenue is the area of the grey shaded rectangle formed by lines p, q and the axes (i.e. the price per unit multiplied by the number of units produced). The total cost of production will be the average total cost per unit (the average variable cost plus the average fixed cost) at quantity Q multiplied by Q (i.e. the area of the hatched rectangle formed by MC, q and the axes in our example). If the point at which Q intersects the demand curve is above the average total cost curve then profit will be earned; if it is below it, a loss will be sustained; and if on the curve, then normal returns to capital will be experienced. Production at point Q (corresponding to the intersection of MC and MR) will maximise any profit or minimise any losses; production at any other level will be sub-optimal.

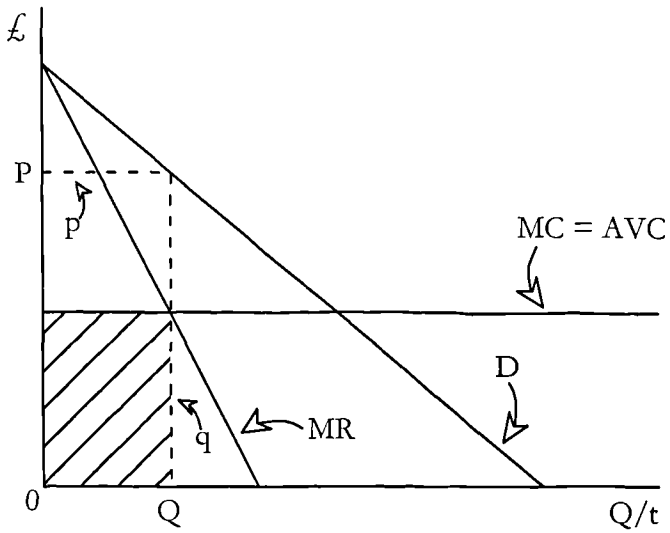

Figure 9: Maximising Profit

Under perfect competition the price will be driven down to the opportunity cost, as if the price charged is higher other sellers will be attracted to the market. Their

production will add to the current total production and, due to the downward slope of the demand curve, this increase in quantity will lead to a lowering of price until it reaches its minimum level. The opportunity cost of the resources used to produce a unit of product will dictate the minimum price for that product, as below that price the bidder would have lost out to the next best use. Where the product in question is a free good the marginal cost will be zero and therefore the optimal price (to maximise use) will also be zero.

Where one-person controls the entire supply of goods, i.e. where there is a monopoly, the monopolist can dictate the quantity produced in order to maximise profits. As a consequence, production will be less than under competitive conditions. This means that there will be an under-utilisation of the resources associated with the production of the goods – as more units of product could be produced at a cost that is less than the consumer would be willing to pay for them. The price that the producer charges for each unit will still be dictated by the demand curve, however, the monopoly price will be more than the competitive price for obvious reasons. Therefore, society will be charged more for the goods than they would under competitive conditions. This will mean that some consumers will satisfy their desire for the monopolised goods (for example, apples) by switching to overall less desirable products (pears), as the high monopoly price of the apples makes pears more desirable.

The effect of monopoly on the supply of a product can be seen in *figure 10* (below). In the absence of monopoly, competition will push the price charged for the goods down to the marginal cost of their production (i.e. to P_c – for simplicity it is assumed that marginal cost is constant and that there are no fixed costs, thus, marginal cost equals average total cost). Therefore, production will be at Q_c, as this is the point at which the demand curve for the product and the marginal cost curve intersect.[7] If the supply of the product is monopolised, however, the monopolist will be unencumbered by competition and will be able to set production at a point that maximises profit (price P_m and quantity Q_m in *figure 10*). The high price causes some consumers to substitute to other products. Where these goods cost more to produce than the monopolised goods, this added cost is a waste to society. The cost of moving from perfect competition to monopolistic price is approximated by the shaded triangle marked DW (deadweight

[7] See the foregoing discussion for an explanation of why competition has this effect.

loss) in *figure 10*. The deadweight loss associated with monopoly can be simply defined as the "welfare loss suffered by those who stop buying the [preferred] product [which] is not off-set by any gain to the seller."[8] In addition, the restriction on supply will mean that there is a possible under-utilisation of resources associated with the production of the product.

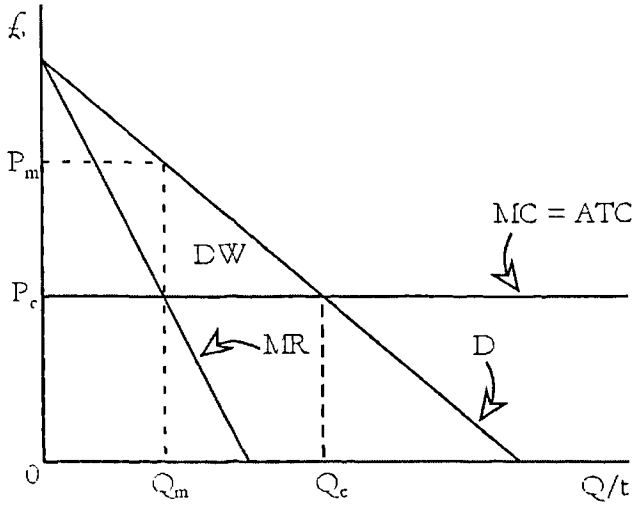

Figure 10: Deadweight Loss

Despite harming society, monopoly benefits the monopolist in a number of ways. First, the fact that the monopolist is, by definition, the only producer in the market means that they do not need to share any profits made, but instead can keep them all to themselves. Second, the ability to dictate supply means that any such profits can be maximised, either by taking advantage of economies of scale without fear of the market being flooded, or by limiting production to get the best price. It is this potential for monopoly profits that provides the traditional incentives associated with the patent system.

The trade-off between the harm inflicted upon society by the imposition of monopoly and the gains from increased levels of inventive activity has been the main focus of economic attention in this area. Implicit in the early studies was the idea of the patent as a perfect tool of appropriation, a perfect monopoly. However, more recently commentators have asked whether this can really be said to be the case.

[8] Corones, *Restrictive Trade Practices Law* (1994; Law Book Co, North Ryde (N.S.W)) at 5. Quoted from Loughlan, *Patents: Breaking into the Loop*, (1998) 20 Sydney L Rev 553, (hereinafter Loughlan) at 565.

Throughout our discussion of the patent system the word 'monopoly' has been deployed, with what verges on reckless abandon, to describe the grant. This use of the term has been influenced by a number of factors, including convenience, tradition and expediency, however, now that we have an economic appreciation of the nature and effect of monopoly in the marketplace it is time to question its suitability to the task. Therefore, before considering the economics of the patent system in any more detail, we turn our attention to the nature of the grant once more, and ask if it can really be called monopoly at all.

Patents as Monopolies – What's in a Word?

It may be thought that the labelling of the patent grant as a 'monopoly' is a largely academic point and that its discussion has no real value. The patent, call it what you like, has an economic effect; its presence distorts the market structure experienced by the product or process that forms the subject matter of the grant. It creates scarcity where there would naturally be none and, in doing so, shelters the proprietor from the full rigors of competition and increases their resistance to price pressure. It creates an area of calm in an otherwise busy market and reduces the availability of substitutes that would fall within the scope of its protection. It unifies source.

However, as already noted, the consequences of monopoly are more than simply economic. The word itself has potent effect in the societal mind. Images of high prices, low quality, and short supply are all conjured up at the mention of monopoly; economists distrust them, the judiciary distrusts them, and people distrust them. The effects of censure and denunciation in the sphere of criminal law are well known,[9] the susceptibility of the trade mark to tarnishing is also widely acknowledged,[10] however the detrimental effect of calling a patent a 'monopoly' is often overlooked. Classification is important, the "question whether a patent privilege is a monopoly is not a mere question of words. It is the point of departure for two distinct theories, under whose influence courts and legislatures may be led to widely different conclusions as to the dividing line between the rights to be conceded to inventors and those to be reserved to

[9] See, for example, Feinberg, *The Expressive Function of Punishment*, *(1965) 49 The Monist 397*, discussing the symbolic significance of punishment.

[10] See, for example, Case C-251/95 *Sabel v Puma*, *[1998] RPC 199*, at paragraph 48.

the public."[11] As the late Giles Rich, one of the authors of the United States' Patents Act of 1952 and respected patent judge, stated: "The tendency is to call a patent "monopoly" when it is to be invalidated or restricted and to say it is not a monopoly when it is held to be valid and infringed."[12]

To what extent, therefore, may a patent be called a monopoly? *The Shorter Oxford English Dictionary* defines monopoly as:

> "Exclusive possession of the trade in some article of merchandise; the condition of having no competitor in the sale of some commodity, or in the exercise of some trade or business"; or,
> "An exclusive privilege (conferred by the sovereign or the state) of selling some commodity or trading with a particular place or country."[13]

The definition in the *Oxford Dictionary of Economics* is somewhat narrower – "A market situation with only one seller."[14]

At its loosest, a monopoly is the right to exclude others from the thing monopolised. However, this is one of the defining features of all forms of private property,[15] and by comparing a patent to a car, a house, or an apple, etc., critics of the monopoly 'nametag' attempt to collapse the conceptual distinction between the patent and other, less 'objectionable' forms of property.[16] It is therefore simple to see that reliance on the pedantry of definition can cloud the issue. Indeed, it is perfectly possible to ""prove" a patent to be what ... [you] want by selection of the proper "authority"."[17]

Whatever its definition, it is clear that the 'monopoly' effects of a patent will vary from invention to invention. Indeed, they will vary from definition to definition, but for any particular definition it is possible to imagine situations in which total exclusion will be effected. A popular example is where there is only one drug with which to treat a

---

[11] Robinson, *The Law of Patents for Useful Inventions*, (1890; Little, Brown & Co., Boston), § 12, at 18-19. Rich, *Are Letters Patent Grants of Monopoly? (1993) 15 Western New England Law Review 239* at 239.

[12] *Ibid.* at 240.

[13] "Monopoly" in Trumble & Stevenson (eds), *Shorter Oxford English Dictionary*, (2002; OUP, Oxford; 5th Ed).

[14] Black, *The Oxford Dictionary of Economics*, (1997; OUP, Oxford), at 307.

[15] See conclusions to this end in Rich, *Are Letters Patent Grants of Monopoly? op cit.* at 254.

[16] Loughlan, *op cit.* at 566.

[17] Rich, *op cit.* at 248.

particular disease, in such a case there is no substitute product. However, this situation will be rare, not least because if there is a large profit to be made other producers will be attracted and will attempt to 'invent around' the patent. Where the monopoly effects of the grant are strong the scope of the exclusion will therefore become of paramount importance. In other situations such effects will be less severe, there will be effective substitutes that expose the patentee to price pressure. But again the scope of the grant will be crucial, as it will dictate the proximity of any new competition.

The breath of protection that a patent offers is necessarily affected by the perception of the grant as a monopoly, therefore the degree of monopolisation is contingent upon the ultimate recognition of the patent as a good or bad use of monopoly power. Loughlan sums up the issue succinctly when she states that "Patents are rapidly becoming one of the defining characteristics of the market economies of contemporary capitalism and yet their inherent nature as an economic monopoly seems to defy the very ideology of competition which constitutes and drives those market economies."[18] She continues, quoting Kastriner, Chief Patent Counsel for Union Carbide Industrial Gases, Inc.: "[o]nce the public misperception of patents changed from anti-competitive "monopolies" to useful stimulants for creativity and economic growth the patent system was revived to an extent..."[19]

In America, Dam[20] notes that the 'patent as monopoly' argument showed up frequently in Antitrust cases in the period spanning from the 1930s to the mid-1980s, and was accompanied by a tangible enmity towards patents. He states that if "hostility had been limited to antitrust cases, it might not have been so serious", however, the same anti-monopolistic sentiment was to be found in patent validity cases as well.[21]

---

[18] Loughlan, *op cit.* at 565.

[19] *Ibid.* Quoting Kastriner, *The Revival of Confidence in the Patent System, (1991) 73 JPTOS 5* at 8.

[20] Dam, *The Economic Underpinnings of Patent Law, (1994) 23 Journal of Legal Studies 241.* See also Rose, *Patent 'Monopolyphobia': A Means of Extinguishing the Fountainhead, (1999) 49 Case Western Reserve Law Review 509.*

[21] *Ibid.* at 268-9. In support of this proposition Dam quotes Justice Douglas in *Great Atlantic & Pac. Tea Co. v. Supermarket Equipment Corp., 340 U.S. 147* (1950, Supreme Court), that: "Every patent is the grant of a privilege of exacting tolls from the public... The Constitution never sanctioned the patenting of gadgets... The fact that a patent as flimsy and as spurious as this one has to be brought all the way to this Court to be declared invalid dramatically illustrates how far our patent system frequently departs from the constitutional standards which are supposed to govern." at 154, 155, 158.

In his discussion of the patent grant, Rich notes the symbolic potency of the 'monopoly' nametag – "to talk of the "patent monopoly" weds patents to prejudice"[22] – but accepts that "monopolistic power is the engine of the patent system".[23] He states that monopoly does not have the capacity to be good or bad, it is simply a power that can be put to good or bad uses. Therefore, in much the same way as Coke distinguished 'odious' from unobjectionable grants in his commentary on the Jacobean Statute, Rich separates monopolies into two categories. First are those in which the use of the monopoly power takes something from the public that they previously enjoyed unrestricted access to. Here the individual has gained at the public's expense and therefore the monopoly is 'odious'. The second category concerns things that never belonged to the public, even before the creation of the monopoly. To this category there can be no objection. Whereas Coke interpreted 'monopoly' to exclude patents, Rich simply states that patents, due to the criteria that need to be satisfied in order to obtain the grant (i.e. that the invention must be novel and inventive) fall into the category of legitimate use of monopoly power. "Unless the grant of a patent gives some kind of economic power to the patentee that he or she would not otherwise have, the patent system would not work."[24]

Thus stated, the patent grant can be said to confer monopoly *privilege* on the right-holder, but this does not necessarily lead to a *de facto* monopoly. Indeed, it is wrong to assume that protection from imitation and the ability to collect supra-competitive rent necessarily means that the patent owner is placed in a position of significant market power at all. Figures from the European Patent Office amply illustrate this. In 2000 there were almost 143,000 patent applications filed at the Office, these resulted in the grant of 27,573 patents.[25] Does this mean that there are nearly 28,000 markets that have been monopolised? It does not. Indeed it is unlikely that any one of these patents has provided, or will provide, its owner with a single monopoly in any market.[26] A television advertisement for a new 'Dyson' vacuum cleaner that was aired in the

---

[22] Rich, *Are Letters Patent Grants of Monopoly?, op cit.* at 239.

[23] *Ibid.* at 252.

[24] *Ibid.* at 251.

[25] See http://www.european-patent-office.org/epo/an_rep/2000/images/gifs/tab76.gif. The actual number of applications in 2000 was 142,941.

[26] See Dam, *op cit.* at 250 for a similar conclusion utilising figures for the United States.

summer of 2000 boasted that the machine was protected by no less than 156 patents, yet Dyson does not have a monopoly of the vacuum cleaner market.

The best that a patent can hope to provide is an increased economic rent for its owner, and this is not in itself objectionable. There are, for example, many instances of natural supra-competitive rents flowing from such things as real estate location, artistic or sporting talent, etc.[27] that demonstrate this effect. It is submitted that the distaste for the increased rent that results from the patent grant is inextricably tied to the misconception of the patent as a monopoly.

Therefore, to summarise, the presence of a patent creates property in an invention as it imposes an artificial scarcity on the knowledge resource required for its operation. Terming the patent grant a 'monopoly' does little to aid any analysis of the system; rather it engenders distaste and breeds distrust. The patent cannot accurately be described as a legal monopoly, although it does create and confer monopoly power. The use of this power is legitimate as nothing is taken from the public that they had previously enjoyed full access to, indeed, before the invention was made the subject matter of the patent was not in existence. However, monopolyphobia clouds the issue and the arguments for and against the system. Therefore, with this in mind, and having already considered some of the early economic and philosophical arguments for the patent system, we turn our attention to discuss the modern economic theory and consider some of the determinants of patent value in the market economy. This discussion necessarily involves consideration of the scope of the patent grant and the various theories that have been advanced to attempt to model the system.

The Economic Argument for the Patent System

As we have seen, the patent system has been justified on the basis that it increases the incentive to invent and invest in invention.[28] Invention is considered to be necessary to

---

[27] These examples are given in Dam, *op cit.* at 250.

[28] See Chapter III, above. Consideration of non-patent incentives, such as lead-time, trade secrecy etc., is outside of the scope of this work. Those interested in these matters are directed to Beckerman-Rodau, *The Choice Between Patent Protection and Trade Secret Protection: A Legal Business Decision*, (2002) 84 JPTOS 371, and Reichman, *From Free Riders to Fair Followers: Global Competition under the TRIPS Agreement*, (1997) 29 New York University Journal of International Law and Politics 11, particularly text accompanying notes 206-249 therein.

the technological progression of society, which, in turn, leads to the creation of societal wealth. In the absence of some form of incentive the level of invention would be too low (sub-optimal). Therefore the patent system offers an *ex ante* incentive to invent and to invest in research and development (R&D) as the offer of a patent grant provides expectation that, provided there is a market for the invention, monopoly profit can be realised. R&D will receive investment if the expected net revenue from the invention over the period of protection exceeds the cost of creating it in the first place.[29]

The *ex ante* incentive to invent is directly related to the *ex post* protection that the patent provides. Inventions are 'public goods' which, absent some form of protection from competition, could be costlessly copied by competitors who did not share the same burden of R&D as the originator. Without protection competing firms could undercut the inventor and drive price down to the marginal cost of production. In this *ex post* analysis the sunken costs of the originator are bygones and will not affect the price at which the product is sold (for, where there is competition, the inventor could not charge monopoly price, as they would then sell no units). Within a market unencumbered by legal protection (or other compensation) for the creator of a new product, or process, there would be a disincentive to invest in R&D. This is an example of where a competitive market will produce an unfair (and economically inefficient) outcome.

As noted above, even Macfie, the most ardent of abolitionists during the 'Anti-Patent' debate, accepted that the unregulated market would produce a disincentive to invent.[30] However, he doubted the efficacy of the patent system in righting the balance between the market and the inventor, and instead suggested the provision of government-funded rewards. This is a suggestion that finds little support in the modern economic literature, however in one study Shavell and Ypersele conclude that a system of optional reward – where the inventor chooses between rewards and patents – is socially superior to patent

[29] As one of the patent attorneys interviewed in connection with Chapter IV stated, "There's a saying in the pharmaceutical industry that whilst the second tablet costs tuppence to make, the first costs a few million pounds... You have to make the numbers add up somewhere, without patents, your competitor makes tablet two and never has to make the first."

[30] See text accompanying note 101 in Chapter III, above.

protection.[31] The same arguments against monetary rewards exist now as did in Macfie's time, *viz.* that such a system is too bureaucratic, that the government is ill equipped to make judgement on the value of invention, that the patent system is fairer since it only taxes those who actually use the invention, etc. However, the point is made; the inventive/innovative system sometimes needs stimulus – a concession that, in itself, provided one of the justifications for patents.

The classical economic and philosophical rationales of the patent system are, however, unsubtle. The arguments advanced in the 'Anti-Patent' debate are essentially binary in their approach; the patent system either is, or is not, justified on balance. Yet "Patents, once established in principle, can either be too broad or too narrow."[32] Early economic treatment of the grant makes no attempt to objectively criticise the scope of the system and to try to re-model it, refining the protection that it affords in order to maximise benefit and minimise loss. In other words, there was little-or-no consideration of variables that could affect the balance; the question of the strength/scope of the grant, for instance, was left open. This narrow approach can be attributed to a combination of factors, including; the relative infancy of economic reasoning, the nature of the debate and the stigmatic association with monopoly, and the changing face of industry. The rationales behind this observation is not, however, of primary importance to our discussion; it is sufficient to note that a line can be drawn at the beginning of the 20th century between the 'classical' and 'post-classical' theories.

Post-Classical Models and Justifications

The modern appreciation of the innovative process stems from the seminal works of Joseph A. Schumpeter, who argued that the traditional view of perfect competition, characterised by perfect knowledge and therefore costless appropriability of invention, is not conducive to *innovation.*[33] He therefore rejected the orthodox view, formulated around quality, price and sales effort, in favour of "competition from the new

---

[31] Shavell & Ypersele, *Rewards versus Intellectual Property Rights*, NBER Working Paper Nº 6956, February 1999. This can be found at http://papers.nber.org/papers/W6956.pdf. This topic is also explored by Abramowicz, *Perfecting Patent Prizes*, *(2003) 56 Vanderbilt Law Review 115*.

[32] Alexander & Grady, *Patent Law and Rent Dissipation*, *(1992) 78 Virginia Law Review 305* at 307.

[33] See Schumpeter, *Theory of Economic Development*, (1936; Harvard University Press, Cambridge (Mass)). This work was first published in German as *Theorie der wirtshcaftlichen Entwicklung* (1911; Duncker Humblot, Leipzig).

commodity, the new technology, the new source of supply, the new type of organization".[34] This process, what Schumpeter calls 'Creative Destruction', "is the essential fact about capitalism".[35] In essence, therefore, Schumpeter puts the flesh on the bones laid down by Bentham, and extends the argument that there will be a sub-optimal level of invention in the absence of some form of incentive to the process of innovation itself. By the time that he was writing the world had changed significantly from that experienced by Bentham; large corporations had begun to take the place of single inventors and the era of corporate led R&D had dawned.

Schumpeter's analysis is significant as it recognises that the motivations for an entity to invest in a process that may result in an invention are clearly not the same as those that inspire someone to invent. The profit-seeking firm will not pour funds into the process of invention if it cannot reasonably expect to be rewarded/compensated for its efforts, whereas the individual may invent for any number of non-profit reasons, for example, enjoyment, fame, necessity, etc. Schumpeter acknowledges the primacy of innovation over invention in the modern economy and therefore limits his discussion to creating industry structures conducive to investment. As Loughlan states, Schumpeter's arguments were "not about how to get a scientist into a lonely lab at night."[36]

This change of focus marks a distinct shift in the theories of protection. Indeed, an understanding of the process of invention (inventing the method of invention, if you like) was in itself a milestone discovery.[37] The classical 'natural law' or 'justice-based' theories[38] still maintain their integrity as justifications for the system *per se*, but the economic rationale now divides.

The traditional incentive argument, where patent protection is justified for only those *inventions* that were induced by the patent system, still operates in an isolated sphere where the required causal relationship between the invention itself and the prospect of a patent can be established. However, Schumpeter's work opens up the arena and

---

[34] Schumpeter, *Capitalism, Socialism, and Democracy* (1947; Allen & Unwin, London; 2nd Ed.). at 84

[35] *Ibid.* at 83.

[36] *Op cit.* at 568.

[37] As Whitehead states, this understanding was the greatest invention of the 19th century; Whitehead, *Science and the Modern World,* (1927; Cambridge University Press, Cambridge) at 126.

[38] i.e. the natural law theory and the reward theory, discussed in Chapter III, above.

clarifies the relationship between innovation and economic growth, enabling others to build and model outside of the classical constraints.[39] It therefore enables the justification of grants where the *innovative* process would have been hampered if the invention could have been freely appropriated in the absence of protection. In other words, even if the invention is not induced by the patent system, protection can be justified on the basis that the investment required to bring it to the public would not have been forthcoming without it.

The 'Patent-Induced' Theory

It might be argued that the difficulty comes in distinguishing between patent induced and non-patent induced innovation. Utilisation of the criteria of inventive step (or non-obviousness) is one method that has been deployed in an attempt to differentiate between those *inventions* that are 'patent-induced' and those that are not.[40] However, as Oddi states, "no means are provided for eliminating the economic costs associating with inventions that can satisfy the nonobviousness standard but still would have been invented without a patent system."[41] Oddi's discussion is directed at the traditional 'patent-induced' invention theory and does not directly address the wider issues that arise from a post-Schumpeterian analysis where innovation, and not invention, is the key. Here the patent acts as a means of directly protecting the investment that has been made in order to get the invention to the public: But for the prospect of a patent the money would not have been put into the research that resulted in the invention, or the invention would not have been brought to the market. Concentration on investment removes some of the problems that are apparent under the traditional theory. For example, where an invention is serendipitous or accidental, it cannot be said that the prospect of a patent induced it. However, investment is essentially proactive; whereas creation can be the result of luck or chance, investment cannot. Therefore, by adding another stage to the analysis, and stating that the process of technological growth is

---

[39] It is clear that Schumpeter was not attempting to provide a model or theory to explain intellectual property, indeed, he mentions patents and other intellectual property rights only in passing. The theories that he advances are limited to increasing understanding of the economic nature of the innovation process, and are necessarily confined to a Capitalist private enterprise economy.

[40] Loughlan, *op cit.* at 568.

[41] Oddi, *Un-Unified Economic Theories of Patents – The Not-Quite-Holy Grail*, (1996) 71 Notre Dame Law Review 267. (Hereinafter Oddi, *Holy Grail*).

dependent upon innovation (which itself produces invention), protection for all but the market-induced innovation and the trivial invention can be justified.

It will be noted that this still leaves the problem of identifying the non-patent induced innovation. In a highly influential study, Scherer developed a categorisation of inventions based on a cost/benefit investment analysis and used this to establish whether in any given category the patent was needed to induce that investment, thereby drawing invention and innovation together.[42] This "topology of inventions"[43] provides the apparatus required to solve the patent-induced problem and, in addition, enables further comparison between groups.

Scherer's categorisation proceeds along the following lines.[44] First there are those inventions that can be described as "revolutionary", i.e. those that Oddi defines as producing "a genuine revolution in consumption or production."[45] For these inventions, which are classified as having an uncertain benefit/cost ratio, the patent system provides a necessary incentive, as it is likely that they would not be forthcoming, or would be seriously delayed, without it. The second class contains the high benefit/cost ratio invention. This category would include those resulting from accident, serendipity, or chance, and which would be classified as non-patent-induced, as there is a high probability that they would be created without a patent system. These are often termed the market-induced inventions. Third is the low benefit/cost invention – i.e. an invention characterised by high development costs compared to the rent that it could support under favourable pricing conditions, or inventions that are developed in an industry where there is a high degree of competition. In such cases the patent system can be said to be necessary for the production of the invention, as without its protection they would be relatively easily copied by others and there would therefore be little incentive to produce them.[46]

---

[42] Scherer, *Industrial Market Structure and Economic Performance*, (1980; Houghton Mifflin, Boston; 2nd Ed.) (Hereinafter; Scherer, *Market Structure*).

[43] Oddi, *Holy Grail, op cit.* at 278.

[44] The classification is condensed from Scherer, *Market Structure, op cit.* at 443-50.

[45] In this case Oddi utilises Scherer's definition of "spectacular technical contribution". See Oddi, *Holy Grail, op cit.* at 278 and Scherer, *Market Structure, ibid.* at 448.

[46] See Scherer, *Market Structure, ibid.* at 447. Also Oddi, *Holy Grail, ibid.* at 279.

Questions of Scope

Justification for patent protection *per se* is only the first step in any analysis, however, for once the decision to have patents is made, or the need for patents highlighted, the next step is to determine their scope. Scherer's 'topology of invention' is, again, helpful in this area as it enables restriction of the inventive field and establishes orderly points for comparison between the different theories that are to be advanced.

For revolutionary inventions, the scope of protection suggested by the patent-induced theory is necessarily broad. The *sine qua non* of these creations must, due to their uncertain cost/benefit ratio, be the patent system. Market factors alone would not be sufficient to justify entities investing the amount of time, effort and money that creation of a spectacular technical contribution would require. Broad protection for these inventions is, therefore, justified; for as Schumpeter demonstrated, such revolutionary creations are an important driving force behind economic growth.[47] This point is easily accepted today, but it is clear that it still took a number of influential empirical studies, including those of Abramowitz[48] and Solow[49] to make economists fully aware of the link between innovation, technological progress and economic growth.[50]

---

[47] The link between innovation and economic growth was one of the revolutionary points made in Schumpeter's *Theory of Economic Development, op cit.* Studies following on from Schumpeter's *Capitalism, Socialism and Democracy*, (1942; Harper & Row, New York) investigated and refined his hypothesis that monopoly and large firms are inherently conducive to innovation.

[48] Abramowitz, *Resource and Output Trends in the United States Since 1870, (1956) 46 American Economic Review 5.*

[49] Solow, *Technical Change and the Aggregate Production Function, (1957) 39 Review of Economics and Statistics 312.*

[50] These two studies are sourced from Takalo, *Essays on the Economics of Intellectual Property Protection*, (ISBN: 951-45-8671-9) an academic dissertation presented to the University of Helsinki and available at http://ethesis.helsinki.fi/julkaisut/val/kansa/vk/takalo/. More recent studies and papers on the importance and effectiveness of patents in inducing invention and research include those of Scherer, *Patents and the Corporation: A Report on Industrial Technology under Changing Public Policy*, (1958; J. J. Galvin, Boston); Taylor & Silberstone, *The Economic Impact of the Patent System*, (1973; Cambridge University Press, Cambridge); Mansfield, Schwartz and Wagner, *Imitation Costs and Patents: An Empirical Study, (1981) 21 Economic Journal 907*; Cohen, Nelson and Walsh, *Appropriability Conditions and Why Firms Patent and Why they do not in the American Manufacturing Sector* NBER Working Paper Nº 7552, February 2000. This can be found at http://papers-nber9.nber.org/papers/w7552.pdf.; and Schankerman, *How Valuable is Patent Protection? Estimates by Technology Field, (1998) 29 RAND Journal of Economics 77.* See also Merges, *Commercial Success and Patent Standards: Economic Perspectives on Innovation, (1988) 76 California Law Review 803.*

For the second and third of Scherer's categories (the high benefit/cost and the low benefit/cost inventions) the patent-induced theory would predict narrow scope. For the former this is because the theory posits that the incentive should not extend further than is necessary to induce the invention. Therefore, as non-patent factors would probably be sufficient to procure a high benefit/cost invention any extra incentive is over-kill. For the low benefit/cost inventions broad scope would reduce the incentive for others to make improvements and would also restrict the use that could be made of the invention, thereby increasing the costs associated with the patent grant.

Criticisms of the Patent-Induced Theory

The primary criticism that can be levelled at the patent-induced theory stems from the difficulties associated with divining which inventions are actually induced by the prospect of a grant, and which are not. Oddi, in an article proposing the adoption of a 'revolutionary patent' for the protection of inventions that provide significant social benefit, suggests the establishment of an 'extraordinary to experts' test to determine patentability.[51] Whilst this might solve the problem for revolutionary inventions (and even then prompts the questions 'How extraordinary?' and 'Which experts?'), it does nothing for those of a less groundbreaking nature, where the difficulties in separating the patent-induced from the non-patent-induced are far greater.

Further, as Ko states, the entire theory "rests on the dubious assumption that the invention would not exist but for the efforts of the inventor who patented it."[52] This is a strong point of contention for those commentators that subscribe to the 'social evolution' theory of invention. This theory states that invention will occur, with or without patents, when the state of basic knowledge and other social conditions are ripe.[53] If this is the case, or even if there is duplicative research in the area of the invention, then the correctness of granting a patent to the first inventor must be questioned.

---

[51] See Oddi, *Beyond Obviousness: Invention Protection in the Twenty-First Century, (1989) 38 American University Law Review 1097.*

[52] Ko, *An Economic Analysis of Biotechnology Patent Protection, (1992) 102 Yale Law Journal 777* at 792.

[53] See, Ko, *ibid.* at note 105 in his text. Also, for an interesting aside on the process of creative thought see Koestler, *The Act of Creation*, (1976, Hutchinson, London; 2nd (Danube) Ed.).

In addition, the 'patent-induced' theory is very simplistic. Indeed, as Oddi states: "The only conclusion that can be drawn from the theory is that if patents were restricted to those inventions that are, in fact, induced by the patent system, then a net benefit would accrue to society."[54] Further, the theory takes no account of the benefit or hindrance that the patent might give to future generations of inventions. It is to this topic that we now divert our attention.

A Brief Aside – The Problem of Cumulative Research

Most early studies on the patent system looked at innovations in isolation, building on Schumpeter's conclusion that big businesses and monopolies are conducive to their production. These embryonic attempts at modelling and understanding the economics of the patent system were necessarily based on the more traditional patent theories and failed to take into account the cross-fertilisation, or spillover, that occurs within the patent system. As Scotchmer states: the real challenge is to "reward early innovators fully for the technological foundation they provide to later innovators, but to reward later innovators adequately for their improvements and new products as well."[55]

Studies conducted by Arrow[56] and Usher[57] in the early 1960s were among the first to demonstrate that the incentive to innovate deteriorates as the level of knowledge spillover increases. However, these early studies tended to see innovation as a linear process, building one block upon the next. The reality is far more complex.

It is clear that the interaction between first- and second-generation inventions will depend on the scope of the primary patent, often called the upstream right[58]. If the patent on the original technology is narrow then this will allow many improvements to be patented and marketed without infringing the primary right.[59] Where the protection

---

[54] Oddi, *Holy Grail, op cit.* at 281.

[55] Scotchmer, *Standing of the Shoulders of Giants: Cumulative Research and Patent Law, (1991) 5 Journal of Economic Perspectives 29* (hereinafter Scotchmer, *Giants*) at 30.

[56] Arrow, *Economic Welfare and the Allocation of Resources for Invention*, in Nelson (ed), *The Rate of Inventive Activity: Economic and Social Factors*, (1962; Princeton University Press, Princeton).

[57] Usher, *The Welfare Effects of Invention, (1964) 31 Econometrica 279.*

[58] See, for example, Rai, *Fostering Cumulative Innovation in the Biopharmaceutical Industry: The Role of Patents and Antitrust, (2001) 16 Berkeley Technology Law Journal 813.*

[59] For an example of a system traditionally seen as providing such rights see Chapter VIII, below.

is broad, licenses will need to be obtained in order for second-generation creators to be able to do the same. As Scotchmer states, this may tempt the reader to conclude that broad protection will encourage "firms to find fundamental technologies, but discourages them to from seeking out second-generation applications and derivative products."[60] However, this conclusion is only partially valid, as the correct incentive may only be provided if the primary patent holder is able to profit from the second-generation technology in a more direct way.

Strong patent protection provides strong incentive to invest in R&D that is likely to result in a patent. However, it also leads to potentially large social costs, such as the inefficiencies associated with monopoly profits (deadweight losses)[61]. Further, it is possible that the incentive created by strong protection may be too great, attracting firms to the 'race' for a patent and causing them to over-invest in research in that area.[62] The fact that only one of the competing firms can be awarded a patent on the invention means that the funds that the others diverted to the race are effectively squandered.

This position is further complicated by the fact that the social value of the primary invention will also include the boost that it gives to subsequent innovators. The 'signalling' potential of the patent is something that is close to the core of Grady & Alexander's 'rent-dissipation theory', discussed below.[63] However, for now it is sufficient to note that the extra social value added to the primary innovation by its signalling potential can fall into one of at least three broad groups.[64] The first occurs where the second generation is reliant upon the first for its existence – i.e. the second generation *could not have been developed* without the first. Here the primary innovation's value to society includes the incremental increase in social surplus added by the second-generation innovation. The second category encompasses situations in which the first

---

[60] Scotchmer, *Giants*, *op cit.* at 30.

[61] See the section on Profit, above.

[62] This is especially pertinent if the real cost of achieving the invention is far less than the market value of the patent. See Scotchmer, *Giants*, *op cit.* at 31; also Loury, *Market Structure and Innovation*, *(1979) 93 Quarterly Journal of Economics 395*. In addition, see the criticisms of the 'prospect' theory set out in text accompanying note 81 *et seq.*, below.

[63] See text accompanying notes 122 *et seq.* below.

[64] These three groups are given in Scotchmer, *Giants*, *op cit.* at 31. The remainder of the paragraph is extensively based on her work.

innovation reduces the costs associated with the second innovation, i.e. the costs of production or of achieving the second-generation. This cost reduction is an additional benefit of the primary innovation, and is added to its social surplus. The final category includes the added-value of obtaining the second-generation more rapidly if the primary innovation accelerates the process of its creation.

The additional benefits created by one generation of technology in respect of the next are often overlooked in the patent literature. It is easy to see why this is the case when the potential permutations and leads offered by any given piece of 'new' technology are considered. However, this oversight provides one of the main criticisms of the existing patent theories. As Scotchmer states: "There are no simple conclusions to draw about the optimal breadth of patents."[65] Prior agreements and licences of technology make the situation even more complicated as they enable circumvention of the potential blocking effects of prior patents.[66] Furthermore, the breadth of any given bundle of patent rights must be dictated by the observable aspects of the patented technology (i.e. the external view of the patent), and not "prior expectations regarding technological outcomes and costs of research."[67] Because the efficacy, or attractiveness, of incentives offered necessarily involves a consideration of the inside of the grant (i.e. a cost/benefit analysis of the value of the invention compared to the cost of the research and the probability of success), the effectiveness of the patent system in protecting incentives is greatly restricted.

One further consequence of the cumulative nature of innovation is that the scope of the patent right will also effectively determine its duration. Schumpeter's process of 'creative destruction', whereby competition comes from new and improved inventions, means that a broader patent will have a longer effective life, as the period of time before it is surpassed by competing technology is extended. It should be noted that this will only be the case where the second-generation product is in competition for the same subset of the consuming public as the first. If the situation is otherwise, for example if

---

[65] *Ibid.* at 37.

[66] On the issue of blocking patents see, for example, Merges, *Intellectual Property Rights and Bargaining Breakdown: The Case of Blocking Patents, (1994) 62 Tennessee Law Review 75*. Also see Kai, *Fostering Cumulative Innovation in the Biopharmaceutical Industry: The Role of Patents and Antitrust, (2001) 16 Berkeley Technology Law Journal 813*.

[67] Scotchmer, *Giants, op cit.* at 38.

the new technology serves a different market, then the life may be independent of breadth.[68]

Therefore, it is clear to see that "patent policy is a very blunt instrument trying to solve a very delicate problem."[69] Up to this point we have been considering the patent grant in terms of the single innovation without really focussing on the impact that the patent grant will have on the downstream incentives to innovate. This competition between the static and dynamic effects of the patent system is something that has troubled many, but has been glossed over by most. For example, as recently as the early 1990s, both Klemperer[70] and Gilbert & Shapiro[71] created economic models for optimal patent scope that did not consider the problems of cumulative innovation. This is somewhat surprising, since in 1977 a theory was first advanced that looked at the benefits that could accrue from granting broad primary patents to co-ordinate downstream research. It is to this theory that we now direct our attention.

The 'Prospect' Theory

The 'prospect' theory is advanced by Edmund Kitch in '*The Nature and Function of the Patent System.*'[72] He argues that the traditional analyses offer an incomplete view, as they do not take into account the fact that the system increases the output from resources used for technological innovation. The patent enables its owner to co-ordinate further R&D efforts by creating a prospect, "a particular opportunity to develop a known technological possibility".[73] The system, therefore, promotes efficiency in the development of each prospect as it publicly awards an exclusive right in the prospect shortly after its discovery. As such, he likens it to the U.S. mineral claims system.

Kitch takes three features of the patent system and uses them as illustrations to justify the importance of the prospect function in its American embodiment; all are, to a greater or lesser extent, also applicable to the British system. The first feature that he highlights is the scope that is awarded to patent claims, "a scope that reaches well

---

[68] Although the value of the patent may be eroded by non-infringing competition.

[69] Scotchmer, *Giants, op cit.* at 40.

[70] *How Broad Should the Scope of Patent Protection be?*, (1990) 21 RAND Journal of Economics 113.

[71] *Optimal Patent Length and Breadth*, (1990) 21 RAND Journal of Economics 106.

[72] (1977) 20 Journal of Law and Economics 265. Hereinafter Kitch, *Nature and Function.*

[73] *Ibid.* at 266.

beyond what the reward function would require."[74] The second feature concerns the fact that the system encourages early filing and hence early claiming, thus emphasising the prospective nature of the grant. A final point that Kitch draws attention to is the fact that there are many patents that have been granted for inventions long before their commercial application became possible. He notes that all three points have played an "important role in the antipatent arguments so recurrent in the economics literature, for each is troublesome under the reward theory"[75]

In developing his theory, Kitch questions the applicability of the traditional downward sloping demand curve to the patented product, suggesting that, as "[m]any patents face competition from other processes or products", the slope will vary from case to case. However, the implication is clearly that the demand curve should be substantially horizontal.

Kitch examines the benefits, or public welfare effects, of a system that offers both trade secrecy and patent protection, and compares it to a system that only protects secrets.[76] He notes seven distinct advantages that the patent system holds over this alternative. These include increased efficiency with which investment in innovation can be managed; a lowering of the costs of contracting with other firms for complementary information and resources;[77] reduction of the amount of duplicative research; reduction of the cost of maintaining control over technology; and provision of returns based on the economic value of the technology rather than speculation on its wealth distribution effects.[78]

---

[74] *Ibid.* at 267. It will be recalled that the traditional 'reward' theory seeks to reward inventive *effort* and therefore does not justify patent protection for serendipitous or accidental inventions. See further, text accompanying note 46 *et seq.* in Chapter III, above.

[75] Kitch, *Nature and Function, op cit.* 267-8.

[76] Kitch reasonably assumes that a system without trade secrecy as an alternative to patent protection is an impossibility "absent the most draconian and costly measures". *Ibid.* at 275. For a discussion of the business decisions that are involved in choosing between trade secrecy and patent protection see Beckerman-Rodau, *The Choice Between Patent Protection and Trade Secret Protection: A Legal and Business Decision, (2002) 84 JPTOS 371.*

[77] As no obligation of secrecy needs to be imposed the discussions can be conducted in the 'open'.

[78] For a complete list of Kitch's benefits see Kitch, *Nature and Function, op cit.* at 275-80.

In making his comparison, Kitch notes that the arguments advanced could be "offered in support of exclusive ownership of anything of value," including land.[79] In essence, therefore, he draws analogy between the intangible patent property and the tangible sphere with which we are all familiar. He attempts to dissolve the intellectual barriers between the two, and insists that the patent right could be treated as any other property right. If this is the case, Kitch advocates creating such rights along the 'frontier of technology', leaving an older core that is free for all to use, concluding that this is a rational distinction since the advantages of the prospect function are confined to the areas where movement is taking place. When discussing the boundaries of this 'frontier', he rejects the non-obviousness standard as a criterion for patentability as "not particularly helpful", instead suggesting that the test of invention should be one of substantial novelty. The question that should be asked when deciding if a patent should be granted is therefore whether this is "information whose significance should be further investigated? In the case of any substantially new technological information the answer to this question is yes because new information could not have been (by definition) previously investigated."[80] Kitch places particular emphasis on the information and notice functions of the patent grant and stresses that in the absence of a system that promotes publication and dissemination of knowledge the same mistakes and successes will be duplicated and this will lead to independent creation of the same inventions, which will waste valuable resources.

The 'prospect' theory has attracted widespread criticism. In a damning article, McFetridge & Smith state that, amongst other things, Kitch does not "understand the implications of allowing basic knowledge to remain a common property right".[81] In particular, any efficiency gains that are made as a consequence of co-ordination through the prospect are "dissipated in the rivalry for the patent itself".[82] All that the system does is to move competition one stage back from the commercialisation of the invention, "since there is no pre-patent right to a patent".[83] They therefore conclude

---

[79] *Ibid.* at 275.

[80] *Ibid.* at 284.

[81] McFetridge & Smith, *Patents, Prospects , and Economic Surplus: A Comment,* (1980) 23 Journal of Law & Economics 197 at 202.

[82] *Ibid.*

[83] Ko, *An Economic Analysis of Biotechnology Patent Protection,* (1992) 102 Yale Law Journal 777, at 801.

that the 'prospect' theory is "not a useful framework within which to assess the merits of the patent system."[84]

In addition, Kitch's assumption of a horizontal demand curve is not one that finds much support amongst commentators; Scherer, in particular, is quoted as expressing extreme discomfort with the notion.[85]

Merges & Nelson, in advancing their own theory of patent protection,[86] dismiss the 'prospect' theory and argue that elimination of rivalry, a goal so close to the core of Kitch's propositions, leads to inactivity and complacency as it "diminishes the threatened costs of inaction".[87] They state that practice shows that co-ordinated development is not better than rivalrous, and note that "there are many instances when a firm that thought it had control over a broad technology rested on its laurels until jogged into action by an outside threat."[88] Scherer also takes issue with Kitch's view of the 'inventing around' problem that is created by the development of broad prospects, stating that it "seems little influenced by any concern for reality."[89] Furthermore, given that it is not possible to know for sure "what possible inventions are in the technological pool", as different parties are likely to view the prospects differently, Merges & Nelson argue that Kitch's attempts to model in order to prevent wasteful overexploitation of the inventive prospect are misplaced. The real danger is not, they insist, from overexploitation, but rather from under utilisation of the prospect post-grant.[90] This last criticism is especially pertinent when the implications for patent scope that flow from the 'prospect' theory are considered.

Implications for Claim Scope

In essence, the 'prospect' theory is concerned with achieving efficiency in co-ordination of research and development by the elimination of *inefficient* competition. Central to

---

[84] McFetridge & Smith, *op cit.* at 203.

[85] In Scherer, *Comment on Edmund Kitch, (1986) 8 Research in Law and Economics 51*. In Oddi, *Holy Grail, op cit.* at 282.

[86] Discussed in more detail below. See text accompanying note 101 *et seq.* below.

[87] Merges & Nelson, *On the Complex Economics of Patent Scope, (1990) 90 Colombia Law Review 839* at 872.

[88] *Ibid.*

[89] Scherer, *Market Structure, op cit.* at 449.

[90] Merges & Nelson, *op cit.* at 873.

Kitch's proposal, therefore, is the idea that a wide patent (or prospect) should be granted initially that would extend to protect subsequent improvements, or refinements, of the invention. The grant of such a right would enable the patent holder to control all versions of the invention until it expires, and would therefore be of great co-ordinating value to its owner. This broad scope would be available for all inventions that passed the test of 'substantial novelty'. Such a wide patent right would be especially important for those inventions that could be defined as 'revolutionary', and therefore of uncertain cost/benefit ratio.[91] For such creations the co-ordinating benefit of a broad scope, enabling control of improvements, would be great as it would offset a degree of uncertainty surrounding the benefits to accrue.

Ko states that the 'prospect' theory finds a certain degree of support in U.S. patent law through the application of the doctrine of equivalents, although co-ordination of future research has never been explicitly stated as one of the justifications of the doctrine.[92] As noted, Kitch's model would seem to support the increases in scope awarded to 'pioneer' inventions over 'mere improvements,'[93] the degree of co-ordination possible for major advances being significantly greater than that applicable for incremental ones. However, this conclusion seemingly exposes inconsistencies in Kitch's internal reasoning and raises questions concerning its application to decided cases. As Grady & Alexander state: under the 'prospect' theory the scope of the rights given to each inventor of a 'substantially new' invention should be much the same, "regardless of how many other inventors might be tempted to develop and exploit improvements".[94] The prospect granted would be a right to exploit the inventive area around the invention, and with Kitch's test of 'substantial novelty' rather than obviousness governing the grant of the patent, 'mere improvements' would not, in general, be patentable.

---

[91] See text accompanying note 45, above.

[92] Ko, *op cit.* at 802.

[93] See, for example the wide approaches formulated by the court in *Westinghouse v. Boyden Power Brake Co.*, 170 U.S. 537 (1898, Supreme Court) and *Ludlum Steel Co. v. Terry*, 37 F.2d 153 (1928, Distict Court of New York) when compared to the narrow approach in *Kinzenbaw v. Deere & Co.*, 741 F.2d 383 (1984, CAFC). Also Ko, *op cit.* at 802.

[94] Grady & Alexander, *Patent Law and Rent Dissipation*, (1992) 78 Virginia Law Review 305, at 315. This appears to be in conflict with Ko's conclusion that in the U.S. broader protection should be provided to the extent that co-ordination will be gained.

Moreover, Beck observes that the Patent Office and the courts have usually avoided granting wide prospects.[95]

Furthermore, specific problems with the application of the 'prospect' theory arise in areas such as biotechnology where unpredictability confounds its central notion of co-ordination.[96] The uncertain nature of some experiments carried out in the field renders predictability, and therefore co-ordination gains, most uncertain.[97] If gains are low then the impediments to creativity that a broad prospect entails will probably outweigh them. This may provide one possible explanation of the fact that small, independent firms, and not corporate monsters, can be seen to drive the biotech industry in contrast to other areas such as traditional pharmaceutical research where size is an important factor.[98] If, as another possibility for biotech patents, direct co-ordination is rejected in preference of wide licensing, so that others develop the patented technology, then the prospect justification for the grant is removed. This, as Merges & Nelson state, would mean that "subsequent development of prospects would proceed in spite of, or at least in indifference to, the broad patent,"[99] which cannot have been within Kitch's contemplation. Therefore, clearly the 'prospect' theory has significant problems matching the reality of the system, even in the U.S. This problem is compounded if the system that it is applied to is that extant in the UK where there is no 'doctrine of equivalents', only purposive construction, which, at its most liberal, gives only narrow supra-literal protection.[100]

---

[95] Beck, *The Prospect Theory of The Patent System and Unproductive Competition, (1983) 5 Research in Law and Economics 193*.

[96] Ko, *op cit.* at 803.

[97] Although it should be noted that as the subject matures, and the processes it deals with become better understood, the predictability of outcome will become much more certain and the 'prospect' theory may be better applied.

[98] See Schumpeter, *Capitalism, Socialism and Democracy, op cit.* for the conclusion that large firms and monopolies are conducive to innovation. Also, Taylor & Silberston, *op cit.* who conclude that of all types of industry pharmaceuticals are most dependent on patent protection.

[99] Merges & Nelson, *op cit.* at 907.

[100] However, this may change with the insertion of a clause on equivalents included in revisions to the Protocol on the Interpretation of Article 69 EPC agreed at the Diplomatic Conference of November 2000 on amendment to the European Patent Convention.

Thus, having concluded that Kitch's 'prospect' theory is at best limited and at worst fundamentally flawed, we now turn our attention to a third post-classical model of patent protection – Merges & Nelson's 'race-to-invent' theory.

The 'Race-to-Invent' Theory

Merges & Nelson first advanced the 'race-to-invent' theory to describe the patent system in their 1990 Colombia Law Review article *'On the Complex Economics of Patent Scope'*.[101] Like Kitch, they lament the relative dearth of economic writing on the issue of patent scope compared to other, more settled, topics such as duration of grant and compulsory licensing, and then set down the criteria for their model. The basic premise of their argument is the principle that "when it comes to invention and innovation, faster is better."[102] They accept that competition will often cause waste, but, unlike Kitch, "have little faith in the imagination and willingness of a "prospect" holder to develop that prospect as energetically or creatively as she would when engaged in competition."[103] In addition, the reality of human organisational thinking and behaviour means that an entity's ability to co-ordinate and orchestrate development is less than perfect. Therefore, they conclude; "we are much better off with considerable rivalry in invention than too little."[104]

The link between the speed of innovation and the overall number of innovations is first explored in terms of simple economic reasoning. "For the same reasons people prefer to have money in hand now, as compared to the same amount (and more, depending on the interest rate) later, so society prefers to have improvements now, rather than later." And second, by searching for consistency with the goals and purposes of patent law itself. Thus, the preference for early reduction to practice, the provisions designed for early filing, and the priority of the first-to-invent,[105] all favour *early* invention.[106] Having

---

[101] *(1990) 90 Colombia Law Review 839.*

[102] *Ibid.* at 878.

[103] *Ibid.* at 877.

[104] *Ibid.*

[105] In the U.S. and a very small number of other countries only.

[106] The same can actually be said of the first to file system that is practised in the UK and most of the rest of the world. Here the first person to apply for a patent is *prima facie* entitled to the grant, regardless of whether they were the first to invent the invention. This system encourages early application, and therefore early invention.

satisfied themselves that the 'race-to-invent' theory is consistent with both the economics and policy of the system, they then use historical case studies to show that technological development has been retarded in industries where broad patent protection was granted, relative to those in which there was significant developmental rivalry.[107]

Criticisms and Implications for Claim Scope

The degree of impedance to the progress of technology, based on historical, economic and policy considerations and case studies, enables Merges & Nelson to define three different areas of invention and to tailor application of the general theory to each. The categories are dynamic, so that a particular field of invention may fall into a different one now than it did in the past, or may in the future when the field matures. "As a result, the issues involved in setting appropriate patent scope change as an industry advances." The three categories that are examined are those of cumulative technologies, the chemical industries, and the science-based industries.[108] Despite this categorisation, the conclusions are startlingly similar: "multiple and competitive sources of invention are socially preferable to a structure where there is only one or a few sources."[109] Therefore scope should be narrow in order to preserve competition, and to place the "inventors of significant improvements... in a strong bargaining position *vis-à-vis* the inventors of basic inventions."[110]

This conclusion is the antithesis of Kitch's prospect function, where co-ordination is of paramount importance. The observation that "every potential inventor is also a potential infringer"[111] is one that was repeated many times during the interviews conducted in connection with the empirical study in Chapter IV, above. It is also a comment that conjures images of anti-patent sentiment, an image, it might be suggested, that patent attorneys would be well advised to keep hidden from clients. In anticipation of this criticism, Merges & Nelson expressly disclaim this conclusion.

---

[107] Merges & Nelson, *op cit.* at 880-908, especially 884 *et seq.*

[108] Industries dependent on scientific breakthroughs rather than incremental improvement, and which are, therefore, capable of great advance in a relatively short space of time. The biotechnology and superconductor industries are examples of this type of business. See Merges & Nelson, *op cit.* at 907-8.

[109] *Ibid.* at 908.

[110] Oddi, *Holy Grail, op cit.* at 283.

[111] *Ibid.* at 916.

Relying on studies such as that conducted by Taylor & Silberston,[112] where it was shown that the patent system is regarded as essential by firms in only a small number of industries, they state that a reduction in the scope of the patentee's monopoly will not severely undercut the incentive to invent. The modifications that they suggest would only apply "to the broader claims of a small number of patents, primarily those on pioneering breakthroughs."[113] Put in this way, it is clear that a model that recommends the narrowing of the scope of pioneer patents is a theory that is aimed at procuring incremental progress over revolution, the contraposition of the patent-induced theory. Indeed, considering the potential benefits available to incremental innovators through non-patent measures, such as lead-time, market recognition, and learning curve advantages, not to mention the short lifetime of most incremental inventions, it has been questioned whether a patent system is needed at all under the 'race-to-invent' theory.[114]

One of the main problems associated with a system of narrow grants is that it may produce excess rent dissipation in the competition to improve upon original, basic patents. In addition, it can be argued that a system that discriminates against pioneer inventions and promotes incremental advancement in this way necessarily promotes secrecy, and thus more rent dissipation through duplicative research.[115] It is therefore the interface between trade secrets and the patent system that provides much of the criticism of the 'race-to-invent' theory.

As Beckerman-Rodau notes, the decision to patent or 'keep secret' is one that is pertinent to all technology, and will be dependent upon a number of factors.[116] One of which is the scope that the eventual patent right will enjoy if granted. Scope plays an

---

[112] Taylor & Silberston, *The Economic Impact of the Patent System, op cit.*

[113] Merges & Nelson, *op cit.* at 916.

[114] See Oddi, *Holy Grail, op cit.* at 283.

[115] It is interesting to note that Japan did not feel the need to have any form of trade secrecy law until 1990, as "No employee would think of taking his house's secrets to another place. Indeed defectors would be treated with suspicion by any subsequent employer, having proven that they could not be trusted." See Rosen & Usui, *The Social Structure of Japanese Intellectual Property Law, (1994) 13 UCLA Pacific Basin Law Journal 32* at 53.

[116] See Beckerman-Rodau, *The Choice Between Patent Protection and Trade Secret Protection: A Legal Business Decision, (2002) 84 JPTOS 371.*

important role in the decision to patent due, in part, to the educative nature of the specification. Regardless of which of the justifications of the patent system we are labouring under, the effect of applying for a grant is standardised. At some point, usually 18 months after application,[117] the invention is published, and therefore laid open to public inspection. It is at this point that the patent first teaches the invention to the patentee's competitors. If its scope is very narrow then they only need make insubstantial changes to evade its area of protection. In such cases secrecy may be the better option.[118]

Second, as Kitch notes, a mistake common throughout the economic literature on innovation is that patents are considered in isolation.[119] This produces a distorted picture of events because it is very rare, if ever, that the patent is the only piece of intellectual property that attaches to, or is associated with, a particular invention. Therefore, economic factors connected with other IP rights (trade marks in the main) may provide non-patent incentives to innovate in certain areas. When combined with a narrow interpretation of claims, these non-patent incentives may mean that for inventions of low life span the patent system becomes an expensive and unreliable alternative to secrecy.[120]

However, it can be argued that the narrowness of the grant, and consequent incremental nature of technological advance, might make the possibility of independent creation more of a risk than would otherwise be the case. This would therefore render the patent system, which protects against such competitive action, more attractive than secrecy. This could then lead to a position in which the technological field would soon

---

[117] See section 16 Patents Act 1977 and Rule 27 of the Patents Act Rules in the UK, also Article 93 EPC and Rules 48-50 EPC Rules. In the U.S. see 35 U.S.C. section 122(b) (1999).

[118] See Beckerman-Rodau, *op cit.* at 364-96 for further discussion of this point.

[119] Kitch, *Elementary and Persistent Errors in the Economic Analysis of Intellectual Property*, *(2000) 53 Vanderbilt Law Review 1727* (Hereinafter; Kitch, *Persistent Errors*) at 1738 *et seq.*

[120] Brand loyalty, and the problems associated with a new product breaking into any particular market may be the decisive factor in any such decisions. Therefore well-known trade marks, such as PEPSI, McDONALD'S, MICROSOFT, COCA COLA, etc., have a strong advantage in the marketplace due to the powerful associations that the consuming public has with them. See also Beckerman-Rodau, *op cit.* at 388-91 and 399-400. Additionally 402, quoting from *Mishawaka Rubber & Woolen Mfg., Co. v. S. S. Kresge Co., 316 U.S. 203* (1942, Supreme Court) at 205; that "A trade-mark is a merchandising short-cut".

become mired with narrow competing interests and the system would fail to operate in any beneficial manner. However, the Japanese experience, a system typified by narrow grants, demonstrates that this problem could be lessened, if not avoided, by anti-competitive regulation of the market, cross-licensing and/or other technology transfer practices.[121]

The final point that will be made on the issue of narrow patents and secrecy is purely financial. Patents are neither cheap to obtain, nor to enforce, and the rights that are granted are far from certain. Depending on the nature of the invention, the number of people that need to have access to it, and the risk of reverse engineering, the cost of secrecy can be high or low. If there is perceived to be a benefit to patenting the invention, i.e. if the costs of the process are outweighed by the benefits that flow from the grant, then it is more likely to be patented. The larger the benefit, the more likely public disclosure is to follow. The narrower the interpretation of the grant, the less the potential returns and the further the scales tip away from patentability.

Therefore, having noted some of the disadvantages of narrow patents arising from the 'race-to-invent' theory, we now turn our attention to the fourth of the post-classical models of the patent system, Grady & Alexander's 'Rent Dissipation' Theory.

The 'Rent Dissipation' Theory

The 'rent dissipation' theory is borne out of dissatisfaction with the traditional view of patent protection as a trade-off between offering an incentive to innovate and encouraging hopeful inventors to "squander valuable social resources in the race to win the patent."[122] Grady & Alexander express disquiet with Merges & Nelson's proposal for narrow patent protection; although never expressly condemning (or even mentioning) the other's work by name they state that such a system "would punish the bold and reward the fussy".[123] Equally, Kitch's 'prospect' theory comes under fire; in "awarding full control to the inventor who is first, the costs of developing dreams that ultimately fail would equal or exceed the benefit to society of those that succeed."[124]

---

[121] See Chapter VIII, below, for more discussion of the Japanese patent system.

[122] Grady & Alexander, *Patent Law and Rent Dissipation, (1992) 78 Virginia Law Review 305* at 306-8.

[123] *Ibid.* at 307.

[124] *Ibid.* at 308.

In providing an alternative theory on which to model the patent system, Grady & Alexander posit that the societal profit from innovation is often far greater than the inventor's developmental costs, and that the inventor should therefore receive the difference as rent.[125] The rent would be paid by way of monopoly right; "otherwise competition by imitators would discourage innovation by making it unprofitable."[126] However, there is an inherent defect in such a system where the benefits to society from having the invention are dissipated by redundant and wasteful investment. Three types of 'rent dissipation' are thus identified that occur at different stages in the process of innovation.

The first arises in the rush for the original monopoly, for only one can receive the prize.[127] The second, in the race to improve upon the patented technology where the patent may 'signal' the way to improvements and thus create wasteful competition in developing those 'prospects'.[128] Third is the rent dissipated where the inventor invests in protecting the secrecy of an invention - i.e. where the expected returns from a patent are not sufficiently attractive to persuade the inventor to make their invention public. The system is optimised where these rent dissipations are minimised, so that societal benefit is at a maximum.

Grady & Alexander remain "agnostic about whether patent rewards are a good idea." Rather, they believe that the courts have "found ways of minimizing the problem that patents create." In other words, they contend that "the patent system seeks to discourage wasteful activities contributing little or nothing to social welfare."[129] The 'rent dissipation' theory is, therefore, their attempt to understand and rationalise the 'glosses' and policies that the courts utilise to "lead them to good results."[130] It is a

---

[125] i.e. the difference between what society would pay for the invention (based on its utility) and the developmental costs.

[126] Grady & Alexander, *op cit.* at 308.

[127] The reader will appreciate that this is a criticism concomitant with the 'prospect' theory, above.

[128] 'Prospect' is this author's addition. This second type of rent dissipation is what Kitch's 'prospect' theory was aimed at preventing. See text accompanying note 72 *et seq.*, above.

[129] Merges, *Rent Control in the Patent District: Observations on the Grady-Alexander Thesis*, *(1992) 78 Virginia Law Review 359* at 360.

[130] Grady & Alexander, *op cit.* at 309-10.

"positive theory of cases interpreting the patent statute as itexists" *(sic)* and therefore is not directly concerned with justifying the system *per se*. However, they note that by minimising the third kind of rent dissipation (that associated with secrecy), implicit justification is provided for the system as it necessarily removes some of the need to keep the invention secret.

The novelty (or as one commentator put it, the genius[131]) of Grady & Alexander's approach is the ability to distinguish between "(a) rents promised by pioneer inventions, and (b) rents arising from follow-on improvements, signaled by the initial discovery at the time that the discovery is patented."[132] *(sic)* As we shall see, this facet of the theory has significant repercussions for the analysis of patent scope.

Criticisms and Implications for Patent Scope

'Rent dissipation' theory offers a more sophisticated approach to the determination of claim scope than either Kitch's 'prospect' theory or Merges & Nelson's 'race-to-invent' theory. The authors concisely articulate the basic position: "Rent dissipation theory predicts that the courts will enforce a patent when the size of the patent rent is proportionate to the rent dissipation that the invention's technological signal would otherwise induce. In this situation, heating up the race to find new patentable inventions is a good social bargain, because patent enforcement cuts off races to improve. Otherwise broad protection is unwise."[133]

Therefore, the key issue is the signalling potential of the invention. In cases where this is high – i.e. where the invention suggests multitude of additional avenues of closely related research – then a patent is justified as it will control further activity and therefore minimise rent dissipation. Where there is little, or no, probability of improving upon the invention (e.g. if the invention is the best solution to the problem that could be devised), the 'rent dissipation' theory would make the unorthodox prediction that a patent should not be granted.[134] Further, "[a]s the value of the invention increases, the case for patentability [or broad enforcement] weakens because the large monopoly rent

---

[131] See Martin, *Reducing Anticipated Rewards from Innovation through Patients: Or Less is More*, (1992) 78 Virginia Law Review 351 at 352 *(sic)*.

[132] *Ibid.*

[133] Grady & Alexander, *op cit.* at 321.

[134] Or if granted, should not be enforced.

conferred on the inventor tends to encourage rent dissipation at the preinvention stage."[135] The most likely candidates for patent protection are therefore those inventions that, "although of comparatively small value, nonetheless signal a large potential for improvement."[136]

The 'rent dissipation' theory would, therefore, predict narrow scope for pioneer inventions in order to minimise the rent dissipation associated with the race for a patent. In this respect it is the antithesis of Kitch's 'prospect' theory. Further, for inventions that provide elegant, unimprovable, solutions to technical problems, the theory would predict even narrower protection. As one commentator notes: "Applying rent dissipation theory would result in the ultimate disincentive for investing in the creation of elegant (basic/revolutionary/pioneer) inventions generally considered the most valuable to society."[137]

The implicit assumption made by Grady & Alexander in connection with the aforementioned criticism is that all rent dissipation is bad. However, as Oddi notes, it is far from clear that this is the case.[138] For example, it is often stated that the fear of competition is one of the factors that spurs on innovation in the first place.[139]

Grady & Alexander's choice of authority to back up their arguments is also a cause of concern for some. Merges notes that it is only in retrospect that the theory explains the outcomes, indeed, this is all that the authors lay claim to. However, the important point to note is that the doctrine under which the cases were decided has evolved over time and, in addition, slight variations in facts may have led to different outcomes, independently of the degree of rent dissipation.[140]

---

[135] Grady & Alexander, *op cit.* at 321.

[136] *Ibid.* at 320.

[137] Oddi, *Holy Grail*, *op cit.* at 285.

[138] *Ibid.*

[139] It will be recalled that one of the criticisms levelled at the 'prospect' theory was that the grant of a broad patent would encourage the holder to 'rest on their laurels'. See text accompanying note 90, above.

[140] See Merges, *op cit.* at 366-7.

Further, despite claiming that it "seems to explain actual patent rulings better than the tests and rules applied by the courts,"[141] the 'rent dissipation' theory has been heavily criticised on the basis that application to actual patent cases is difficult. The fact that the technological signalling potential of an invention is the determining factor in their analysis is the major cause of this complaint. Martin, for example, doubts whether it is possible to know when an invention signals improvement and when it does not: "What if improvements were signalled but had not yet occurred when an infringement claim is brought?"[142] There is no guidance as to the amount of time that is allowed to pass before the 'signalling' assessment is satisfied. If an invention is created that is *currently* the most elegant solution to a problem and therefore unimprovable, the 'rent dissipation' theory would suggest that no patent should be granted. The invention may only begin to be *understood* as signalling when future technological advances 'catch up' with it – does this mean that it is less deserving of patent protection now?

Grady & Alexander provide no "specific criteria and only a few examples"[143] to aid in the interpretation of this core provision of their model. Indeed, they themselves state that "[t]o some extent, assessing an invention's technological signal requires guesswork on the part of judges." However, they stress that "[t]he need for judicial clairvoyance is ... reduced by the time that inevitably lapses between Patent Office action and litigation involving the validity of that action."[144] This is far from sound as an explanation of the shortcoming, primarily as it introduces a degree of hindsight into the analysis, which the British courts, especially, are keen to caution against.[145]

Indeed, it is apparent that Grady & Alexander give very few hard guidelines concerning the application of their theory at all. The balancing act between the benefits and costs associated with granting a patent on a particular invention, for example, remains somewhat of a 'black art'. An unfortunate effect that flows form this is that the theory suffers from a lack of objective reproducibility and capacity for verification. As Oddi cautions, "while the same degree of scientific verifiability [as a unified theory in physics]

---

[141] Grady & Alexander, *op cit.* at 322.

[142] Martin, *op cit.* at 356.

[143] *Ibid.*

[144] Grady & Alexander, *op cit.* at 320.

[145] See, for example, the judgment of Mance LJ. (in the majority) in *Wheatley v Drillsafe Ltd, [2001] RPC 133* at paragraph 90.

cannot be expected of economic theory, methodological rigor may not be ignored."[146] Rich's comments on the 'patent as monopoly' arguments, therefore, seem equally apt when considering this theory: You can ""prove" a patent to be what ... [you] want by selection of the proper "authority.""[147]

Recent Alternatives

Discussion of the economics of the patent system would not be complete without brief mention of two recent alternative theories that claim to provide a more satisfactory explanation of the primary function of the patent system than those already advanced.

Meter Theory of Patent Protection

In the first, entitled *The Primary Function of Patents*, Carvalho specifically argues against the reward and prospect theories of patent protection. He states that the system cannot operate to reward the actions of the inventor as patents "have no intrinsic value and do not automatically confer competitive advantage."[148] He therefore sides with Penrose,[149] and reasons that if the system was, in reality, one of reward, then some degree of proportionality between inventive effort and remuneration should be expected.[150] This is clearly not the case in a system where technical and economic (societal)[151] value is subservient to market value and the whims of the consuming public. Indeed, a system that attempted to increase fairness by assessing the merits of each and every invention would run the risk of introducing unwanted externalities into the process, such as the risk of abuse, that would paradoxically act to tip the balance in the opposite direction.[152]

When discussing the 'prospect' theory of patent protection, Carvalho is no less critical. "The prospect function presents the same problems as the reward function: both are only partially correct and neither constitutes a primary concern of the patent system."[153]

---

[146] Oddi, *Holy Grail, op cit.* at 326.

[147] Rich, *op cit.* at 248.

[148] Carvalho, *The Primary Function of Patents, [2001] Journal of Law, Technology and Policy 25* at 25.

[149] Penrose, *The Economics of the International Patent System*, (1951; Johns Hopkins Press, Baltimore) at 28-9.

[150] The Penrose quote is simple and elegant: "for great inventions, great patents; for small inventions, small patents." *Ibid.*

[151] i.e. actual economic benefit to society, as opposed to the benefit perceived by the consuming public.

[152] And therefore make the process biased and unfair. On this point see Carvalho, *op cit.* at 31-2.

[153] *Ibid.* at 35.

"The bulk of inventions are made by companies ... [and c]ompanies do not invent 'in the dark'. Inventing is already a risky enough business, let alone inventing without knowing the intended practical application of the eventual results."[154] Therefore, the prospect theory cannot be said to explain anything more than a few 'visionary' cases "whose creativity is ahead of their time."[155]

In their place, therefore, Carvalho advances his own theory wherein "patents serve as relatively accurate meters of an invention's value to society." Market forces facilitate the 'metering' function, the fidelity of which is dictated by "two essential characteristics of the patent system: disclosure of inventions ... and pre-determination of the terms of protection,"[156] (what Carvalho respectively calls 'quantification' and 'qualification' of the invention). The patent therefore enables realisation of the value of the technology that forms its subject matter and eliminates the transaction costs that are associated with other forms of management such as trade secret protection or government funding.[157] This reduction in transaction costs is Carvalho's "cornerstone justification of the patent system,"[158] and provides a basis for his later comment that "meters perform better when clear."[159] Therefore, he suggests that, if indeed this is the 'primary function' of the patent system, there should be a preference for narrow, and thus more certain, claim scope, although never explicitly stating this to be the case.

When compared to other theories of patent protection, the crux of Carvalho's conclusion appears alarmingly simple, so simple, in fact, that it verges on being a mere statement of the obvious. "... [T]he patent system exists because it is the only known legal institution that allows inventors to put a price on technology and at the same time permits society to measure, through the competitive interplay of market forces, the

---

[154] *Ibid.* at 27-8.

[155] *Ibid.* at 28.

[156] Carvalho, *op cit.* at 28.

[157] The transaction costs arising from trade secrecy are obvious. Those associated with government funding arise because of the choices that have to be made in deciding whether a particular avenue of research deserves pursuing. This process necessarily involves some estimation of the value of the end product, the invention, which, in turn, introduces the possibility of pursuing political rather than strictly economic considerations, therefore potentially adding social cost into the equation.

[158] Carvalho, *op cit.* at 52-3.

[159] Carvalho, *op cit.* at 74.

adequacy of such a price with relative efficiency."[160] This is true, to a point. However, as the reader will appreciate, even this explanation of the existence of the system is too complex. In its most basic form, the patent system today operates and exists because a system of providing protection from competition to the creators of new manufactures has done, in one form or another, for over 500 years. As Machlup concluded in his review of the U.S. Patent system in the 1950s: "No economist, on the basis of present knowledge, could possibly state with certainty that the patent system, as it now operates, confers a net benefit or a net loss upon society.... If we did not have a patent system, it would be irresponsible, on the basis of our present knowledge of its economic consequences, to recommend instituting one. But since we have had a patent system for a long time, it would be irresponsible, on the basis of our current knowledge, to recommend abolishing it."[161] The patent system exists, therefore, primarily because of familiarity and reliance built up over a long period of time; this is, as far as this author can ascertain, the most pragmatic explanation of the system as we experience it. However, whilst this is an *explanation* of the current state of affairs, it is far from rigorous as a philosophical or economic *justification* or model of the system; it is on this point that Carvalho's thesis also fails.

In his rush to ascribe a 'new' primary function to the tangled philosophical and economic roots of the system, he slips into the trap of merely describing it, rather than ascribing a model upon which to justify it. The key to his theory is the fact that the patent enables the market to 'relatively accurately' decide the price of the invention, it commercialises the subject matter and rescues it from the realms of intangibility, transforming it into an asset that has real monetary value. However, this is not, strictly speaking, what a patent does. The appearance of the patented technology on the balance sheets of the entity that holds the rights is simply a by-product of this process, an effect rather than a cause. A patent does nothing to the subject matter itself; it merely prevents others from profiting from the protected technology without the consent of the right holder. It offers limited protection from competition and may therefore assist in the decision to disclose the information that it protects, or indeed to

---

[160] Carvalho, *op cit.* at 52.

[161] Machlup, *An Economic Review of the Patent System*, Study No. 15 of the Sub-Committee on Patents, Trademarks and Copyrights of the Committee on the Judiciary, U.S. Senate 85th Congress, 2nd Session, (1958; Washington) at 80-1.

embark upon the creative process. Furthermore, the price that is charged for the invention will, logically, be as close to the profit maximising price as the right holder can reasonably expect to go without jeopardising sales.[162] This price may be significantly above that which the majority of society would be prepared to pay for the goods, and therefore possibly above the *value* of those goods to society as a whole, as long as there are some that value them highly. The technology itself (necessarily subsequent to creation) has a market value with or without patent protection. All that the patent does is enable the holders to appropriate more of this for themselves.

Seen in this light, it is clear that Carvalho's thesis is little more than a combination of the classical 'incentive to disclose' and 'incentive to invent/invest' theories dressed in fancy clothes. "[A]n accurate metering of technology improves efficiency in the allocation of private resources into R&D,"[163] i.e. the ability to appropriate the profit maximising market worth of an invention (as opposed to the competitive price) will affect the decision to invest in the creation of technology. As the reader will appreciate, this is hardly rocket science. All other 'insights' into the system come from a similar series of banal observations, superficially disguised.

Patents as Incomplete Contracts

The second of these recent additions to the stable of economic opinion revisits the concept of the patent as a bargain between the inventor and the State. However, in *Patents as Incomplete Contracts*,[164] Kesan & Banik propose a model of protection that significantly deviates from the classical theories upon which it is ultimately based. In their words, they put forward a proposal that "is an incentive-compatible trade that maximizes joint social surplus."[165]

---

[162] Assuming, that is, that they are acting, and indeed are free to act, to maximise profits and do not have some ulterior agenda.

[163] Carvalho, *op cit.* at 54.

[164] *(2000) 2 Washington University Journal of Law and Policy 23.* The full title is *Patents as Incomplete Contracts: Aligning Incentives for R&D Investment with Incentives to Disclose Prior Art.*

[165] *Ibid.* at 27. The reader will note that this theory offers more in the way of proposals than justifications, however, it is included as demonstration of the continuing utility of the classical theories in modern economic opinion.

Their starting point is logically, therefore, classical theory: "By conferring rights to the inventor to exclude others from making, using, or selling a patented invention without a license, patents provide incentives for inventors to invest in costly and risky R&D." They continue; "Patents also encourage the dissemination of information about new inventions, thus permitting competitors to build upon or develop improved versions of patented inventions." However, whilst noting these positive aspects of protection, the authors also recognise the social costs associated with the patent system and therefore state that "efficient patent systems aim to induce investment in R&D while limiting losses due to market power."[166]

Kesan & Banik explain[167] that the losses due to market power, indeed the market power of the patent itself, can be limited by the granting of narrow patents, thereby reducing the scope of the patentees monopoly and their ability to fend off competing, but not directly duplicative, technology. The increase in public welfare that accompanies a more competitive market is, however, at all times offset by the reduction in incentive that the narrow scope provides for future investment in R&D. This classic balancing act between the need for 'fair protection for the patentee' and 'a reasonable degree of certainty for third parties' will be familiar to the reader as a recurring theme that runs throughout this work. However, the point at which Kesan & Banik's theory departs from this well-trodden path is in their appreciation of the partial-contractual nature of the patent right: "While analyzing patent policy in the same way as any other property rights is an attractive proposition, several differences ... are crucial."[168]

These differences, primarily the possibility of post-grant rescission of the right by invalidation of one or more of the claims, prompt Kesan & Banik to view the patent as a "contingent... probabilistic property right." Further, they reason that the uncertain nature of the inventive process and the possibility of invalidation due to post-grant discovery of prior art mean that "the public cannot "contract" with the inventor to create a new invention but instead must establish patent enforcement rules by which a patent may be invalidated."[169] They continue, stating that these defects in the contract

---

[166] *Ibid.* at 23-4.

[167] *Ibid.* at 24-5.

[168] *Ibid.* at 25.

[169] *Ibid.*

theory[170] of patent protection are remedied if one considers the patent, not as a fully formed contract, but rather as one that is incomplete, the gaps being filled by the substantive rules of patent law that enable the grant to be invalidated. Such "default rules confer broad residual rights to the public to invalidate a patent through post-issuance litigation."[171]

Two forms of incompleteness are discussed. The first is the legally incomplete (or literally incomplete) contract, whereby some aspect of the contract's operation is left unspecified over a set of circumstances in which the contract is to apply. The second is the economically incomplete contract, which relates to the "ex post efficiency of contractual outcomes." In this latter case, the question that should be asked is whether the contract allows "the joint surplus of the parties to be maximised by taking into consideration the buyer's marginal valuation of the good and the seller's cost?" Such a contract is considered to be incomplete because the "immutable terms of the contract prevent parties from engaging in mutually beneficial trade."[172] This second type of incompleteness may result where one party to a contract withholds information that would maximise the *joint* surplus of the parties. This will occur, for example, where the patentee does not disclose a potentially fatal piece of prior art to the Patent Office and then, if granted, sets licence fees at a (low) level that will minimise the risk of litigation[173] and yet still provide income for the holder of the right. Here the joint surplus of the parties (patentee and public) is not maximised as the added benefit to the patentee of having a broader (yet more precarious) patent than would otherwise be the case is offset by the cost to society of a grant covering something that is not new. Furthermore, the social cost of an unwarranted patent will be exacerbated by the expense of litigating to

---

[170] Whereby the patentee is presented with incentive to invent/disclose the invention in return for the improvement to the technological standing of society and associated welfare gains that the publication of the specification provides.

[171] Kesan & Banik, *op cit.* at 26.

[172] *Ibid.* at 28.

[173] This conclusion is drawn from Lanjouw & Schankerman, *Enforcing Intellectual Property Rights*, NBER Working Paper Nº 8656, Dec. 2001. Who conclude that the perceived value of a patent is one of the determinants of whether a patent will be challenged, the more valuable the right, the more likely a challenge is to be forthcoming. They also note that the size of the firm holding the patent can be important, with patents owned by small enterprises being more likely to be embroiled in litigation than those owned by larger firms. The paper can be found at http://papers.nber.org/papers/W8656.pdf.

invalidate the grant. Yet this danger of economic incompleteness is inherent in the patent system as the prosecution "process does not provide adequate incentives for the patentee to reveal such information."[174] This comment is especially pertinent in high technology fields, such as biotechnology, where the patentee and the Patent Office are "asymmetrically informed about the relevant prior art."[175]

To Conclude

None of the traditional or post-classical theories of patent protection detailed above provide us with a definitive model.[176] All are, to some degree, concerned with the classical view of the patent being obtained solely for the market effects that its exclusionary nature creates. As noted in Chapter IV, above, this view of the system is often out of step with the commercial reality in which patents are sought for a number of reasons only remotely connected with their attendant 'monopoly'.

In addition, all of the theories are found wanting when questions of real life applicability are considered. They are all theoretical without application, and skirt round the question of how a court would actually utilise the principles that they espouse in its determination of the scope of a patent, instead concentrating on an *ex post facto* analysis of decided cases in an attempt to divine some sense of order and logic from an essentially human endeavour.[177] As Oddi notes, doubt must be cast on any theory that "premises itself on a limited number of non-randomly selected cases."[178] All fall foul of this point. Moreover, the nature of the comparisons made between sometimes wildly differing technological fields also brings the theories into question as it seems to this author that the interpretation placed upon the claims and the level of generality with which they are viewed must depend on the intended addressee. Therefore, any attempt to provide a general theory of interpretation for all nature of invention is fundamentally flawed from the outset. Further, any theory must be rejected that considers all cases to

---

[174] Kesan & Banik, *op cit.* at 30.

[175] *Ibid.* at 32.

[176] To be fair to the authors of these theories, very few either tried or claimed to have succeeded in creating the definitive answer to the patent system.

[177] i.e. they are too theoretical, without practical application. Although again, to be fair not many of the theories actually claimed that they were anything more than analytical models of the system.

[178] Oddi, *Holy Grail, op cit.* at 326.

have been rightly decided,[179] as error is an integral part of any human experience. The shifting formulations and evolving doctrines evident in all legal spheres, especially one as fast moving as that linked with high-technology, mean that the courts get the chance to review past decisions, to trim and shape, and move with the times. Historical judgments are important because they tell us what the law is not and reveal the pathways by which the current law came to be made. Mistakes are possible and bad decisions probable. Times change and a general theory will always struggle to explain and rationalise something as fickle and situationally dependent as human reasoning.

As Oddi sagely states, "the outcome of actual patent litigation may be better explained on the attitude (bias) of the court toward patents at the time of decision" than by any unified theory. To this end, the "pro-patent bias of the Court of Appeals for the Federal Circuit is palpable and may offer a far better indicator of patent validity and infringement than any of the economic theories."[180] This author agrees.[181] Economic theories may help to decide what the scope of protection of any given grant should optimally be, but modelling the vagaries of the human mind is outside of their current understanding. Therefore, having viewed the arguments and models advanced to justify and explain the provision of patent protection, this author is left with the feeling that grant and litigation is ultimately an expensive lottery where the prizes are big, and the chances of winning proportional to the financial status of the interested parties. Thus, in words echoing Machlup's conclusion in his review of the U.S. Patent system in the 1950s,[182] the best justification that we currently have for the patent system is the fact that we currently have a patent system.

It has been the purpose of these three chapters on *Patents Within the Market Economy* to provide insight into the economic and theoretical literature on this topic, and more specifically the determination of patent scope, whist alerting the reader to the fact that certain 'settled' issues may not be what they first seem. The issue of 'monopoly-phobia'

---

[179] See Merges, *Rent Control in the Patent District: Observations on the Grady-Alexander Thesis*, (1992) 78 Virginia Law Review 359, at 367; also Oddi, *Holy Grail, op cit.* at 326, who states, at note 366, that: "Some cases, of course, were never "good law.""

[180] Oddi, *Holy Grail, op cit.* at 326-7.

[181] Although he also notes that the tide in the CAFC's favours may now have turned. See further Chapter VI, below.

[182] Reproduced in text accompanying note 161, above.

is one that has tainted patent decisions on both sides of the Atlantic, on and off, ever since the inception of the system.[183] Despite convincing arguments advanced by Kitch,[184] Dam,[185] Rich,[186] Rose,[187] and Loughlan[188] etc., that the patent grant cannot accurately be described as producing an economic monopoly, the sentiment can still be found in popular opinion. This public distaste for monopoly finds itself reflected in judicial pronouncements, both in this country and abroad. The traditional British position in relation to determining patent scope has already been discussed,[189] however, it is clear that other States' patent doctrines deal with the problems in different ways to our own, and it is to these differences that we now direct our attention.

Three caricatured systems are seen to be in evidence in addition to the UK. The first, America, offers two-tier protection, extending a patent's scope under the doctrine of equivalents to supplement the literal meaning of the claims. The second, Germany, offers traditionally broad protection for the 'general inventive idea' that lies behind the invention. Finally we look to Japan, where the system is traditionally characterised by very narrow protection giving rise to many small patents. Each system is examined in turn before moving our focus back to the UK in order to reflect upon the current state of affairs in the light of our findings.

---

183 See Rose, *Patent 'Monopolyphobia': A Means of Extinguishing the Fountainhead*, (1999) 49 Case Western Reserve Law Review 509.

184 Kitch, *Elementary and Persistent Errors in the Economic Analysis of Intellectual Property*, (2000) 53 Vanderbilt Law Review 1727.

185 Dam, *The Economic Underpinnings of Patent Law*, (1994) 23 Journal of Legal Studies 241.

186 Rich, *Are Letters Patent Grants of Monopoly?* (1993) 15 Western New England Law Review 239 at 239.

187 Rose, *Patent 'Monopolyphobia'*, *op cit.*

188 Loughlan, *Patents: Breaking into the Loop*, (1998) 20 Sydney L Rev 553.

189 In Chapter I, above.

PART II

-

COMPARATIVE FACTORS

CHAPTER VI

America

-

Promoting the 'Useful Arts'

"Congress shall have power... To promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries."

– Article 1, s.8, cl.8 of the Constitution of the United States of America

Preface

There are three systems that together have been claimed to handle nearly 90% of the total patent traffic in the world.[1] The customary approaches to claim interpretation in the three varies wildly, from the traditionally narrow 'sub-literal' Japanese approach, to the German courts' broad protection of the 'general inventive idea'.

In the first of our comparative chapters, however, we turn our attention to the United States and the patent system extant there. The U.S. system in many respects treads a middle path between Germany's traditionally broad protection and the narrowness of Japanese grants. Full treatment of the jurisdiction could create a work of many times this size, therefore the subject matter of this Chapter has been limited, often crudely, to the bare bones of the 'doctrine of equivalents', the central pillar of claim theory in the U.S.

In the United States, as in the United Kingdom, the theory upon which claim drafting is based is that of peripheral definition, where the claims mark the outer boundary of protection. Their scope is determined by the application of a two-stage test whereby the literal scope of the wording used is augmented by recourse to the doctrine of equivalents. The doctrine is justified on the basis that it tempers "unsparing logic and prevent[s] an infringer from stealing the benefit of an invention."[2] Therefore, combining a reasonable degree of certainty for third parties with a reasonable degree of fairness for the patentee.

Discussion of the American system is deemed necessary as, not only does it provide informative illustration of the manner in which protection for equivalents can operate, thereby providing insight into the possible operation of a European doctrine,[3] but it

---

[1] Namely the American, European and Japanese systems. See Isayama, *Japan's Views on a Desirable IP System for the Global Economy, (1999) 2 Journal of World Intellectual Property 679* at 685.

[2] Per Justice Jackson, delivering the leading judgment in *Graver Tank v Linde Air Products, 339 U.S. 605* (1949, Supreme Court) at 608.

[3] As provisioned in the amendments to Article 69 of the European Patent Convention and the Protocol on its Interpretation agreed at the Munich Diplomatic Conference in November 2000, and adopted by the Administrative Council of the European Patent Organisation on 28th June 2001.

also allows us to appreciate the context from which much of the pressure for expansion of the patent right originates.

We begin by briefly considering the historical development of the doctrine from Colonisation to the landmark decision of the Supreme Court in *Graver Tank Co. v Linde Air Products Inc.*,[4] before moving on to assess the impact of *Graver Tank* itself. Recent developments in U.S. law will then be considered, including the infamous *Festo*[5] litigation, which has just completed its second *en banc* passage through the Court of Appeals for the Federal Circuit (CAFC).

---

[4] *Op cit.*

[5] *Festo Corporation v Shoketsu Kinzoku Kogyo Kabushiki Co., Ltd*, 234 F.3d 558 (2000, CAFC, *en banc*), 535 U.S. 722 (2002, Supreme Court), Unreported decision of the CAFC (*en banc*) of 26th September 2003.

Early History

As noted, American patent law has at its core the idea that the claims mark out the boundaries of the invention. However, this has not always been the case; indeed it was only in 1836 that Congress first codified the practice of using claims at all.

U.S. patent law is grown from a British seed, and as such its lineage is traceable (in terms of historical markers, if not defining acts) through the common law of the 18th century, the *Statute of Monopolies*, Elizabethan practice and, ultimately perhaps, to the Statute of Venice.[6] As a colony of the British Empire, the 'newly discovered' North America inherited the English law concerning 'monopolies' upon Colonisation. It was transported to the dependency with the first settlers where it evolved into a patent custom initially little changed from that of the motherland.

Working on the jurisdictional boundaries of the original 13 States, patents were granted in America from 1641.[7] Such was their utility that the practice continued under the Articles of the Confederation after the Revolution. However, initially little was done to change the existing system, and by the 1780s problems concerning the limited jurisdiction of the patent grant had led to dispute between States. A paradigm example of this is the problems connected with the development of interstate steamboat lines, which was hampered by conflicting patents issued in separate States.[8]

Partly in response to this jurisdictional problem, and partly due to pressure for furtherance of the Union, the Constitutional Convention of 1789 resolved to make patent protection in the United States a right of the people. Therefore, Article 1, s.8, clause 8 of the U.S. Constitution provides Congress with the power "to promote the Progress of Science and useful Arts, by securing for limited Times to Authors and

---

[6] For more information on the history of the British system, see Chapter II, above.

[7] A patent issued by the State of Massachusetts. See Merges, *Intellectual Property in the New Technological Age*, (1997; Aspen Law & Business, New York) at 125.

[8] Walterscheid, *The Early Evolution of the United States Patent Law: Antecedents (5 Part I)*, (1996) 78 JPTOS 615 at 632-7, also *The Early Evolution of the United States Patent Law: Antecedents (5 Part II)* (1996) 78 JPTOS 665 at 673-84. See also Flexner, *Steamboats Come True. American Inventors in Action*, (1944; Viking Press: New York), and Merges: *Patent Law and Policy: Cases and Materials*, (1997; Michie, Charlottesville, Virginia; 2nd Ed.) (hereinafter Merges, *Patent Law and Policy*) at 8.

Inventors the Exclusive Right to their respective Writings and Discoveries". Thereafter, a nation-wide patent system was created by legislative power in 1790 in the very early days of the first Congress; as Merges notes, this reflects the importance of this matter.[9]

Early American patent law, like its English cousin, was raw in comparison to its modern incarnation, and it was not until the Patent Act of 1836 that Congress adopted a recognisable modernistic approach to the protection of invention.

The 1836 Act is noteworthy for a number of reasons, not least because extended the possibility of protection to "citizens or residents of any country", protection formerly being limited to resident citizens only,[10] and also it established for the first time a formal system of examination. The latter replaced the simple registration scheme introduced by the 1793 Act,[11] which was fraught with problems as it gave no power to refuse a patent grant on grounds of a lack of novelty or usefulness.[12] However, it should be noted that the 1836 Act also gave the applicant the right to "compel issue of a patent by bill in equity, against an adverse decision of the Commissioner and of the Board of Examiners," a practice that Vojáček states provided an "excellent safeguard of the rights of the inventor."[13]

The Act also introduced a requirement that the potential patentee "particularly specify and point out the part, improvement, or combination, which he claims as his own invention or discovery."[14] Although significant from a Legislative point of view, this

---

[9] See Merges, *Patent Law and Policy*, *ibid.* at 9.

[10] Although, it should be noted that there was still a raked fee scale for U.S. and non-U.S. citizens. Americans paid $30 for a patent, British inventors were asked to pay $500 and all others $300. See Vojáček, *A Survey of the Principle National Patent Systems*, (1936; Prentice Hall, New York), (hereinafter Vojáček) at 117.

[11] Registration was introduced in the Amendment of 1793 as a replacement for the original procedure whereby the patent application was subjected to the examination of three high-level Government Officials – See Merges; *Patent Law and Policy*, *op cit.* at 10.

[12] Any attack on these grounds had to be conducted in court, giving rise to much unwarranted litigation.

[13] Vojáček, *op cit.* at 119.

[14] s.6 Patents Act 1836. See Hantman, *Doctrine of Equivalents*, *(1988) 70 JPTOS 511* (hereinafter Hantman) at 517. Also Takenaka, *Interpreting Patent Claims in the United States, Germany and Japan* (1995) IIC

requirement was simply codification of the existing practice required by the Courts and established some fifteen-years earlier in the case of *Evans v Eaton*,[15] in which Justice Story stated that the:

> "specification ... has two objects: one is to make known the manner of constructing the machine ... so as to enable artizans to make and use it ... The other object of the specification is, to put the public in possession of what the party claims as his own invention, so as to ascertain if he claims anything that is in common use, or is already known, and guard against prejudice or injury from the use of an invention which the party may otherwise innocently suppose not to be patented..."[16]

This was, however, a significant departure from previous practice, where the invention merely had to be described so as to distinguish it from other things before known.

Infringement at this point was decided on principles laid down in the case of *Odiorne v Winkley*, where it was stated that "[m]ere colorable differences, or slight improvements, cannot shake the right of the original inventor."[17] The question of where the border between 'colourable' and 'substantial' difference lay was resolved in the 1817 case of *Gray v James*, in which Justice Bushrod Washington charged the jury:

> "...[W]e think it may safely be laid down as a general rule, that where the machines are substantially the same, and operate in the same manner, to produce the same result, they must be in principle the same. I say substantially, in order to exclude all formal differances; and when I speak of the same result, I must be understood as meaning the same kind of result though it may differ in extent."[18] *(sic)*

Therefore, laying down for the first time the, now classic, 'function-way-result' or 'triple identity test'.

Publications Vol. 17 (hereinafter Takenaka, *Interpreting Claims*) at 6; and Jessup, *The Doctrine of Equivalents*, *(1972) 54 JPOS 248*.

[15] The case first reached the Supreme Court in 1818 – *16 U.S. 454* (1818, Supreme Court) – and was the first time that a substantive patent issue had done so. The Court remanded the issue for a new trial and it returned to the Supreme Court in 1822 – *20 U.S. 356* (1822, Supreme Court). It is this latter case in which the practice was formally established.

[16] *20 U.S. 356* at 433.

[17] Per Circuit Justice Story, charging the jury. *18 F.Cas. 581* at 582 (1814, Circuit Court for Massachusetts; Case Nº 10432).

[18] *10 F.Cas. 1015* at 1016 (1817, Circuit Court for Pennsylvania; Case Nº 5718).

'Central Definition Theory'

Despite requiring claims in the 1836 Act, it was not until almost 35 years later that they came to define the extent of protection. Up to the passage of the 1870 Patents Act, the scope of protection was determined by reference to the description in the specification and the drawings. Therefore, in much the same way as the claims of a German patent were traditionally understood to do little more than describe one form of the invention, so too the early American claims functioned as guides to draw attention to the invention's prominent features, and little more. Therefore, they often referred to numbered elements in the drawings and to the specification with the phrase "substantially as herein described" or "substantially and for the purpose set forth".

The scope of the patent, however, covered all forms that embraced the principle or mode of operation disclosed in the patent and gave the same effect. Therefore, in *Winans v Denmead*, Justice Curtis, delivering the opinion of the Court, stated

> "It is generally true, when a patentee describes a machine, and then claims it as described, that he is understood to intend to claim, and does by law actually cover, *not only the precise forms he has described, but all other forms which embody his invention...*"[19] (emphasis supplied)

Therefore, the scope of protection extended to the preferred embodiment (as claimed) and its equivalents. This method of claim drafting, defining the invention using claims including only its prominent features and extrapolating from this central point in the determination of infringement, has been referred to as 'central definition theory'[20] and, as we shall see, bears close likeness to pre-1981 German practice.

Winans v Denmead is also important as it is considered by many to be the first case in which the doctrine of equivalents was voiced.[21] The litigation involved a patent for a

---

[19] See *Winans v Denmead*, 56 U.S. 330 (1853, Supreme Court) at 342.

[20] As opposed to the 'peripheral definition theory' that categorises the current British approach. See further, text accompanying notes 1-6 in Chapter I, above. Also, Deller, *Patent Claims*, (1971; Lawyers Co-operative Publishing (Bancroft-Whitney), New York, 2nd Ed.), Section 9. Takenaka, *Interpreting Claims*, *op cit.* at 3-12; and Hantman, *op cit.* at 517.

[21] See the opinion of the Supreme Court in *Graver Tank & Mfg Co. v Linde Air Products Co.*, 339 U.S. 605 (1949, Supreme Court) at 608; see also Takenaka, *Interpreting Claims*, *op cit.* at 9. However, Hantman, *op cit.* at 518 states that the "*Winans* principle is a restatement of the charge to the jury in ... *Evans v Eaton.*" He does, however, concede that it was the first time that the principle appeared in a Supreme Court decision.

railway car designed to carry coal. The question that was before the Court was whether a car in the shape of a tapered hexagonal pyramid infringed the patent, which described and claimed a car in the shape of a frustum of a cone. Both designs operated in substantially the same way to achieve the same increased load-bearing benefits. Justice Curtis, adding to the previously quoted passage, stated that the protection offered by a patent extended beyond the precise form portrayed:

> "...[I]t being a familiar rule that, to copy the principle or more of operation described, is an infringement, although such copy should be totally unlike the original in form or proportions."[22]

Evidently, at this time the doctrine of equivalents was not used to supplement the normal scope of protection, it was the primary tool in such a determination. However, it is generally accepted that it was used to expand beyond the literal scope of the claim language.[23] This is eminently clear for so-called 'pioneer' inventions, understood to mean a new device performing a completely new function, which were given a very broad range of equivalents.[24] Yet, at the time of the *Winans* decision, the claims of the patent did not yet define the scope of the invention, they were merely an expression of one form that it might take, and as such did not limit the extent of the monopoly in any way. Seen thus, it is easy to explain the expansive doctrine of equivalents as a product of the 'central definition theory' and thereby limited to it. However, by the time the 1870 Act was in place the days of 'central definition theory' were over, replaced by a sterner, more literal, approach to the determination of patent scope.

---

[22] *Winans v Denmead, op cit.* at 342

[23] However Hantman, *op cit.* at 527-8 questions whether this can be said to be the case. He uses the dictionary definition of a cone, which he concludes covers a conical form without a circular base, and therefore argues that the infringing railway car actually falls within the literal wording of the claims. He fails, however to note that the test for literal infringement is not, and has never been, whether the accused device falls within the scope of the claims as they might be interpreted. The test is whether the alleged infringement falls within the claims as interpreted by the Court. In *Winans* "cone" was interpreted as requiring a circular base, therefore it is clear that a tapered hexagonal prism cannot be said to fall within the literal scope of the claim *as interpreted.*

[24] For example the electro-magnetic telegraph patented by Morse in 1840 was considered to be of "pioneer" status and thus was allowed a broad range of equivalents. Although in *O'Reiley v Morse*, 56 U.S. 62 (1853, Circuit Court for Kentucky) the court was unwilling to extend the equivalency to all machines performing the same function no matter how far changed from the original.

'Peripheral Definition Theory' and the 1870 Act

A slow but inexorable shift in the importance placed on claim language had been evident throughout the life of the 1836 Act[25] and was completed by a subtle change in wording in the 1870 Statute. Section 26 of the latter provided that the inventor:

> "shall particularly point out *and distinctly claim* the part, improvement, or combination which he claims as his invention or discovery"[26] (emphasis supplied).

Subsequent Supreme Court decisions highlighted the importance of the claims as a separate and distinct part of the patent and emphasised the value of clear and concise language in order that the public interest was not impeded.[27] The rise of 'peripheral definition theory' had begun.

It will be recalled that in contrast to 'central definition theory', where the scope of the patent is determined by the description in the specification and drawings, under 'peripheral definition theory' the extent of protection is determined by the scope of the claim. The claims are said to mark out the boundary, or periphery, of protection. Only structures falling within their wording could be said to infringe the patent. Thus in *Merrill v Yeomans*[28] the Supreme Court stated:

> "The act of Congress ... very wisely requires of the applicant a distinct and specific statement of what he claims to be new, and to be his invention... This distinct and formal claim is ... of primary importance, in the effort to ascertain precisely what it is that is patented to the appellant in this case."[29]

Adding that:

---

[25] See further, Prager, *Trends and Developments in American Patent Law from Jefferson to Clifford (1790-1860), (1962) 6 Amercian Journal of Legal History 47*. Also Prager, *The changing views of Justice Story on the Construction of Patents, (1960) 4 American Journal of Legal History 14*.

[26] Patent Act of 1870, ch. 230, § 26, 16 Stat., 198-217 (July 8, 1870).

[27] See for example *Merrill v Yeomans, 94 U.S. 568* (1876, Supreme Court). In which Justice Miller, giving the opinion of the Court states that the language of the claim in the instant cases is: "...far from possessing that precision and clearness of statement with which one who proposes to secure a monopoly at the expense of the public ought to describe the thing which no one but himself can use or enjoy...". *Idem.* at 570.

[28] *Ibid.*

[29] *Ibid.* at 570.

> "No [question of construction] ... could have arisen if appellant had used language which clearly and distinctly points out what it is that he claims in his invention."[30]

Here the Court refused to find that a patent, which claimed a "new manufacture of the deodorized heavy hydrocarbon oils, suitable for lubricating and other purposes" extensively described in the specification, was infringed by production of the product by other means. Whilst the conclusion that can be drawn from the case, that a process patent is not infringed by production of the end-product by other means, seems rather obvious to a student of the modern patent system, this represented a substantial departure from previous practice at the time.

Similarly in *Keystone Bridge Co. v Phoenix Iron Co.*, Justice Bradley, giving the opinion of the Court, emphasised that:

> "When the terms of a claim in a patent are clear and distinct (as they always should be), the patentee, in a suit brought upon the patent, is bound by it... He can claim nothing beyond it."[31]

Seen in this manner, this early development of U.S. theory clearly defines the claims as fulfilling two distinct purposes. In the first, they formed the consideration for the patent grant and thus gave validity to the applicant's bargain with the State. Second, they notified the public as to the extent of the patentee's monopoly, and it was this latter function that slowly came to dominate. Thus, in *White v Dunbar*, Justice Bradley famously stated:

> "Some persons seem to suppose that a claim in a patent is like a nose of wax, which may be turned and twisted in any direction, by merely referring to the specification, so as to make it include something more than, or something different from, what its words express. The context may, undoubtedly, be resorted to, and often is resorted to, for the purpose of better understanding the meaning of the claim; but not for the purpose of changing it, and making it different from what it is. The claim is a statutory requirement, prescribed for the very purpose of making the patentee define precisely what his invention is; and it is unjust to the public, as well as an evasion of the law, to construe it in a manner different from the plain import of its terms." [32]

Increased emphasis on the 'public notice' function of the claims had several consequences. First, it spurred on acceptance of peripheral definition theory. Second,

---

[30] *Ibid.* at 569.

[31] *95 U.S. 274* (1877, Supreme Court) at 278.

[32] *White v Dunbar*, *119 U.S. 47* (1886, Supreme Court) at 51-2

the latitude given to patentees in infringement proceedings was significantly narrowed and protection was denied for mere inventive concept.[33] Finally, because claims enabled applicants to define their inventions more specifically, Courts began to require that they did so. Therefore the old "substantially as described" claim format was struck down, the Court in *Hobbs v Beach* stating that the phrase adds little to the claims:

> "If these words are used, the patentee may still prove infringement in the use of a mechanical equivalent; if they are omitted, he is bound to prove no less. Perhaps it would be sufficient to say that, if a doubt arose upon the question whether the infringing machine was the mechanical equivalent of the patent device, that doubt should be resolved against the patentee where the claims contain the words 'substantially as described or set forth.'"[34]

Therefore, as time had gone on, and the claims had assumed their role in defining the boundaries of patent protection, the early liberal attitude to the determination of scope, and the expansive doctrine of equivalents that accompanied this, had been gently, but sternly, phased out.

The knock-on effect of increased judicial reliance on claim language was that the patentee, robbed of this former interpretative latitude, took to enlarging the literal scope of their claims as much as possible. It became common practice to include such stock phrases as "means for" or "adapted to" in an attempt to broaden claim language.[35] Thus, in a series of cases that can be said to have reached culmination in *Westinghouse v Boyden Power Brake Co.*,[36] the doctrine of equivalents was used to restrict the claims by limiting infringement to only some of the structures within their literal scope. This method of limitation was based on sufficiency of disclosure, its justification being that the claim should only validly cover the subject matter that the inventor actually discloses and equivalents thereof. Therefore:

> "The patentee may bring the defendant within the letter of his claims, but if the latter has so far changed the principle of the device that the claims of the patent, literally construed, have ceased to represent his actual invention, he is as little subject to

---

[33] i.e. the general inventive idea.

[34] *180 U.S. 383* (1901, Supreme Court) at 400.

[35] See Hantman, *op cit.* at 522. For recent illustration of the effect that the phrase "means for" can have on the breadth of protection afforded to a patent in the U.K. see *Warheit v Olympia Tools Ltd.*, *[2002] EWCA Civ 1161*. Discussed by Dunlop, *Court of Appeal gets to Grips with the Protocol, [2003] EIPR 342*.

[36] *170 U.S. 537* (1898, Supreme Court).

> be adjudged an infringer as one who has violated the letter of a statute has to be convicted, when he has done nothing in conflict with its spirit and intent."[37]

Thus, in a string of cases towards the end of the 19th century, the American courts can be seen to be using what would now be termed the 'reverse' doctrine of equivalents to restrict protection to less than that actually claimed.

The reader will appreciate that the patent systems of Europe were undergoing a similar age of unrest at this point in time. As discussed in Chapter III, above, the mid-to-late-19th century marked a period in which a new breed of political economists had begun to question the foundations and justification of patent law, and the fear of broad monopoly stifling domestic industry was, once again, brought to the fore. The Netherlands abolished its system during this period,[38] and in England the patent law was the subject of heated debate resulting in significant changes to the law. The period in which inventors and their inventions were romanticised by the populace was coming to an end, replaced by 'big' business and corporate research and development, and the idealistic image of the lone heroic inventor was banished to fairytale.

Graver Tank

The early-20th century marked a period of vacillating protection in the United States' patent system. A number of strategically important patents in key industries, such as the light-bulb,[39] the aeroplane,[40] the basic design of the automobile,[41] and in the area of wireless telegraphy,[42] had established significant market power for the entities that owned them. This domination of the market in several key areas did not go unnoticed

---

[37] Per Justice Brown, giving the opinion of the Court in *Westinghouse v Boyden, ibid.* at 568.

[38] The Netherlands patent law was repealed in July 1869. See Machlup & Penrose, *The Patent Controversy in the Nineteenth Century, (1950) 10 Journal of Economic History 1* at 5.

[39] U.S. Patent № 223,898, issued January 27, 1880, to Thomas A. Edison for an incandescent electric lamp, in which the leading wires are secured to a carbon filament by cement carbonised in situ.

[40] U.S. Patent № 821,393, issued May 22, 1906, to Orville and Wilbur Wright for a flying machine – notably for a system of steering and stabilisation.

[41] U.S. Patent № 549,160 granted November 5, 1895, to the George B. Selden for an improved road engine.

[42] U.S. Patent № 586,193, granted July 13, 1897 and reissued June 4, 1901 as reissue № 11,913 to Guglielmo Marconi for improvements in transmitting electrical impulses and signals and in apparatus therefore.

by the judiciary and, driven in part by a number of anti-competitive acts committed by large patent controlling companies, the courts became increasingly unwilling to enforce patent rights.[43] This trend is amply illustrated by reference to the statistics of Supreme Court decisions in the first forty years of the 19th century, see *figure 1*, below.

Years	Total number of opinions	Patents held valid	Patents held invalid	Patents held not infringed
1900-05	9	2	3	4
1906-10	7	3	1	3
1911-15	4	4	0	0
1916-20	16	5	9	2
1921-25	14	3	8	3
1926-30	12	3	5	4
1931-35	14	3	11	0
1936-40	15	0	13	2
Total	91	23	50	18

Figure 1: Results of Patent Litigation before the Supreme Court of the United States[44]

However, it would appear that America's involvement in World War II may have helped to alter the balance, as it was towards the end of the 1940s that the expansive doctrine of equivalents, which had lain dormant since *Westinghouse*,[45] was brought back to life.

The Decision in *Graver Tank*.

Graver Tank & Mfg Co. v Linde Air Products Co.[46] has been hailed as one of the most important decisions in the development of American claim interpretation theory.[47] It stands as a buoy in a sea of anti-monopolistic sentiment, and affirms the survival of the expansive doctrine of equivalents thought by many to be long dead.

---

[43] This trend is mirrored, to a certain degree, by narrow interpretation in the U.K. courts at this time. See, for example *E.M.I. v Lissen*, *(1939) 56 RPC 23*.

[44] Taken from Fox, *Monopolies and Patents: A Study of the History and Future of the Patent Monopoly*, (1947; University of Toronto Press, Toronto), at 266. Also, Baum, *The Federal Courts and Patent Validity: An Analysis of the Record*, *(1974) 56 JPOS 758* at 776-7 notes that in the period 1921-73 the Supreme Court held invalid 82% of the patents that it considered. See also, Janicke, *To be or not to be: The Long Gestation of the U.S. Court of Appeals for the Federal Circuit*, *(2002) 69 Antitrust Law Journal 645*, at 646.

[45] *Westinghouse v Boyden Power Brake Co.*, *op cit.*

[46] *339 U.S. 605* (1949, Supreme Court).

[47] See, for example, Takenaka, *Interpreting Claims*, *op cit.* at 13.

The case involves an action for infringement bought by the owner of a patent for fluxes used in electric welding, and the process of welding using them. The patent in question essentially disclosed and claimed a combination of alkaline earth metal[48] silicate and calcium fluoride - the actual flux produced and sold under the patent contained silicates of calcium and magnesium. The allegedly infringing product was similar except that it contained silicates of manganese and calcium – the former not being an alkaline earth metal. In all other respects the two compositions were identical, producing the same kind and quality of weld and operating in the same way. The question that faced the Court was whether the substitution of manganese – not an alkaline earth – for magnesium took the allegedly infringing flux out of the scope of the patents claims.

In answer to this question, the Supreme Court laid down a two-stage test for the determination of infringement. Justice Jackson, giving the opinion of the Court, began by stressing the importance of the claims in the determination of patent scope, declaring:

> "If accused matter falls clearly within the claim, infringement is made out and that is the end of it."

However, he continued saying that:

> "...[To] permit imitation of a patented invention which does not copy every literal detail would be to convert the protection of the patent grant into a hollow and useless thing. Such a limitation would leave room for - indeed encourage - the unscrupulous copyist to make unimportant and insubstantial changes and substitutions in the patent which, though adding nothing, would be enough ... [to evade] the reach of the law... [It] would place the inventor at the mercy of verbalism and would be subordinating substance to form. It would deprive him of the benefit of his invention and would foster concealment rather than disclosure of inventions, which is one of the primary purposes of the patent system."[49]

The doctrine of equivalents, he explained, evolved in response to this experience: "To temper unsparing logic and prevent an infringer from stealing the benefit of an invention,"[50] its essence being that "one may not practice fraud on a patent."[51]

---

[48] Those elements found within group II of the periodic table, i.e. beryllium, magnesium, calcium, strontium, barium and radium.

[49] *Graver Tank, op cit.* at 607.

[50] *Ibid.* at 608 quoting Judge Learned Hand in *Royal Typewriter Co. v Remington Rand, 168 F.2d 691* (1948, Circuit Court of Appeals, Second Circuit)

[51] *Graver Tank, op cit.* at 608.

The Court cited with approval the opinion of Justice Sanford in *Sanitary Refrigerator Co. v Winters*[52] stating that the doctrine may be utilised against an alleged infringement if it performs substantially the same function in substantially the same way to obtain substantially the same result. It added to this 'tripartite test' by highlighting that any difference between the two devices must represent an insubstantial change. The Court further highlighted the importance of "known interchangeability" between the claimed element and its equivalent.[53]

Criticism of the Decision

The Court cited *Winans v Denmead*[54] as establishing the doctrine and, disregarding the changes in claim format that had occurred in the intervening period, stated that it had been consistently applied by the Courts ever since. Whilst it is true that the Supreme Court had never explicitly overruled the expansive doctrine in the years following *Winans*, it has been argued by academics and practitioners alike that to suggest consistent application is a bit far-fetched. Indeed, Hantman goes as far as to argue that *Graver Tank* is an abomination reviving an anachronistic expansive doctrine that has no place under 'peripheral definition theory'. He states that "[i]t was not reasonable for the Court to compare an alleged infringing invention with the claimed invention using a doctrine developed a hundred years earlier to apply to a situation in which the claims were not the measure of the invention."[55] Further, he contests that it goes against the fundamental principles of the 'peripheral definition theory' of claim drafting, as it introduces unacceptable ambiguity into infringement proceedings.

However, Hantman's argument fails to take account of a number of small, but in the opinion of this author, important points. First, under 'central definition theory' the doctrine of equivalents provided *the* test for infringement, there was no other. Second, the Court in *Graver Tank* stresses the importance of the claims in the determination of patent scope, stating that they define the invention, and reduces the doctrine of

---

[52] The original passage referred to states that a "substantial equivalent of a thing, in the sense of the patent law, is the same as the thing itself; so that if two devices do the same work in substantially the same way, and accomplish substantially the same result, they are the same, even though they differ in name, form, or shape." *280 U.S. 30* (1929, Supreme Court) at 42.

[53] *Graver Tank*, *op cit.* at 609.

[54] *Op cit.*

[55] Hantman, *op cit.* at 543.

equivalents to a secondary measure supplementing an 'all elements rule' so that one-to-one equivalence is required. Third, and possibly most importantly, it recognises that the doctrine may also be used to restrict protection where "the device is so far changed in principle from the patented article that it performs the same or a similar function in a substantially different way, but nevertheless falls within the literal words of the claim..."[56] It is therefore apparent that, far from resurrecting a long-forgotten principle and unleashing it upon an unsuspecting world, the Court made clear the role of the doctrine under peripheral claim theory. It updated it and applied it to modern practice.

Therefore, whilst Hantman's argument would be valid if the Court simply used the old doctrine of equivalents established under *Winans* without change this is not what it did. To argue such a point is simply an exercise in verbalism and avoids the question of whether the doctrine as laid down in *Graver Tank* is, in substance, the same as that under central definition theory. Quite simply, it is not. The motivation for extending protection on an equivalents basis is the same under both authorities, but, whereas previously it was subordinate to nothing, under *Graver Tank* it is a supplemental tool, second string to the 'all element', literal infringement rule. Indeed, as Takenaka correctly points out, it can be said that by clarifying the claim language as the primary point of reference in any patent infringement action, and by stressing the importance of a claim referring to an accused device, *Graver Tank* can actually be seen as the case that established peripheral definition theory.[57]

Hantman's second argument, that the decision introduces an unnecessary degree of uncertainty into the patent process and therefore is against the public interest, is powerful in the fight against revival of the doctrine. However, it is apparent that the Court in *Graver Tank* was adequately aware of this a viewpoint, and actually intended such imprecision. It explained:

> "Equivalence, in the patent law, is not the prisoner of a formula and is not an absolute to be considered in a vacuum. It does not require complete identity for every purpose and in every respect. In determining equivalents, things equal to the same thing may not be equal to each other and, by the same token, things for most purposes different may sometimes be equivalents. Consideration must be given to the purpose

[56] *Graver Tank*, *op cit.* at 608-9

[57] Takenaka, *Interpreting Claims*, *op cit.* at 13.

> for which an ingredient is used in a patent, the qualities it has when combined with the other ingredients, and the function which it is intended to perform."[58]

The Court accepted that that one of the primary objects of patent law is "to promote the Progress of Science and useful Arts" by duly rewarding the inventor. It recognised that to permit evasion of penalties for infringement by making insubstantial changes to the invention as claimed, whilst still allowing the wholesale theft of its substance, would soon render the patent useless. Moreover, it acknowledged the fallacy of limiting patent protection to the literal scope of the claims, stating that this would encourage the concealment of invention, therefore going against another tenet of patent law. Thus, Takenaka concludes that without the doctrine of equivalents "peripheral definition theory can never function completely and effectively to implement patent policy."[59] However, whilst this may be the case, it is not clear that patent policy itself could not be implemented without the doctrine, as business practices and expectations could be changed in order that the goals, as stated, could be realised. As we shall see, this is the situation that occurred in Japan where traditionally narrow interpretation of claims forming the periphery of protection forced the system as a whole to react in order that the underlying policy could be implemented.[60]

Section 112 Equivalents

Shortly after the decision in *Graver Tank*, Congress revised the patent law. Section 112 of the 1952 Patents Act included requirements for the claims and the description of the invention, and was, in many ways similar to that of the 1870 Act. However, the section also included a paragraph for which no precedent existed and which deserves some attention, it reads:

> "An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof."[61]

Thus, a second type of equivalent, often confused with the judicially created doctrine of equivalents, was introduced into American law. The Court of Appeal for the Federal

---

[58] *Graver Tank*, *op cit.* at 609.

[59] Takenaka, *Interpreting Claims*, *op cit.* at 17.

[60] See further, Chapter VIII, below.

[61] s.112(6).

Circuit (CAFC) went to great lengths to explain the difference between the two in *D.M.I. Inc. v Deere & Co.* stating:

> "[T]he word "equivalent" in §112 should not be confused ... with the "doctrine of equivalents." In applying the doctrine of equivalents, the fact finder must determine the range of equivalents to which the claimed invention is entitled, in light of the prosecution history, the pioneer-non-pioneer status of the invention, and the prior art. It must then be determined whether the entirety of the accused device or process is so "substantially the same thing, used in substantially the same way, to achieve substantially the same result" as to fall within that range. In applying the "means plus function" paragraph of §112, however, the sole question is whether the single means in the accused device which performs the function stated in the claim is the same as or an equivalent of the corresponding structure described in the patentee's specification as performing that function."[62]

The rationale behind s.112(6) was clearly stated in *O.I. Corp. v Tekmar Co.*, where Judge Lourie said that it was "intended to permit use of means expressions without recitation of all the possible means that might be used in a claimed apparatus." However, "[t]he price that must be paid for use of that convenience is limitation of the claim to the means specified in the written description and equivalents thereof."[63] Therefore, "[i]f the specification is not clear as to the structure that the patentee intends to correspond to the claimed function, then the patentee has not paid that price but is rather attempting to claim in functional terms unbounded by any reference to structure in the specification. Such is impermissible under the statute."[64] Thus, the Court made clear that the doctrine was not to be interpreted as providing expansive protection, rather its application was strictly limited by the disclosure in the specification. As such, it cannot be seen as creating a patch of 'central definition' within a statutory framework. Rather, s.112 informs the claim meaning for a literal infringement analysis, by restricting the scope of a (potentially broadening) functional claim limitation. The doctrine of equivalents, on the other hand, extends the enforcement of claim terms beyond what is literally described in the event that there is equivalence between elements of the patented article and the alleged infringement.[65] Therefore, as the statutory provisions merely assist in the determination of literal infringement, they can only embrace those

---

[62] Per Chief Judge Markey, giving the opinion of the Court, *755 F.2d 1570* (1985, CAFC) at 1575.

[63] *115 F.3d 1576* (1997, CAFC) at 1583.

[64] Per Judge Clevenger, in *Medical Instrumentation and Diagnostics Corp. v. Elekta AB*, [Unreported] Decision of the CAFC of 22nd September 2003.

[65] See *Al-Site Corp. v VSI International Inc.*, *174 F.3d 1308* (1999, CAFC).

equivalent structures or acts existing at the time of issuance. 'After arising equivalents'[66] can only infringe, if at all, under the doctrine of equivalents.

Hostility and Instability

The years after the Supreme Court's acceptance of the expansive doctrine of equivalents in *Graver Tank* are marked with inconsistency and confusion in the application of the doctrine.[67] A certain degree of anti-monopolistic sentiment continued and the result was a line of cases in which the doctrine was interpreted and applied very narrowly. Thus, in *Feed Service Corp v Kent Feeds Inc.*[68] a decision of non-infringement was made for a process where reactants were fermented in the reaction vessel rather than being added separately. In *Deyerle v Wright Manufacturing Co.*[69] the use of a pin to fix bone fractures was held not to infringe a patent calling for a "fixing nail". Here the Court stressed that as the invention was not 'pioneer', but was rather "an improvement in a crowded art", the claims were therefore only entitled to a narrow range of equivalents. A similarly narrow interpretation is found in *General Dynamics Corp. v Whitcomb*[70] where a patent calling for a wing body extending "just forward" of the position of maximum panel thickness was not infringed by a similar design in which the body extended four-feet forward this position, even though this was minimal compared with the length of the wing. The Court here holding that "differences in form and shape may weigh importantly in the balance 'where form is of the essence of the invention.'"[71]

In addition to the uncertainty and intrinsic subjectivity of the 'tripartite' test, additional defects also developed. Litigants began to exploit cracks in the test and to "dispute what specific function, way, or result characterized the invention or the accused device,

---

[66] i.e. those arising after issue of the patent.

[67] See Takenaka, *Interpreting Claims, op cit.* at 17. Also Comment, *Peripheral Definition Theory v Central Definition Theory in Patent Claim Interpretation: A Survey of the Federal Circuit, (1967) 32 George Washington Law Review 609.*

[68] *528 F.2d 756*, (1976, United States Court of Appeals, 7th Circuit).

[69] *496 F.2d 45*, (1974, United States Court of Appeals, 6th Circuit).

[70] *443 F.2d 630*, (1971, United States Court of Appeals, 4th Circuit).

[71] *Ibid.* at 633. See further Noonan, *Understanding Patent Scope, (1986) 65 Oregon Law Review 717* at 725-9.

with each side advocating the particular function, way, or result that would cause it to win."[72]

The resulting doctrinal instability was further enhanced by regional variations in judicial hostility in the District Appeal Courts. As Noonan notes, the patentee "almost always lost in the Second and Eighth Circuits but almost always won in the Tenth Circuit."[73] One of the consequences of such marked regional prejudice was an increase in forum shopping. This added to the cost of litigation by introducing an often-lengthy pre-infringement action to decide the trial venue; that is in cases where it did not effectively decide the issue by referring the case to the Eighth Circuit where "patents simply were not valid."[74]

By 1982 the problem of regional inconsistency was so bad that Congress itself decided to address the problem by setting up the Court of Appeals for the Federal Circuit (CAFC) to which it gave overall jurisdiction in all patent appeals and decisions of the United States Patent and Trademark Office (USPTO).

The Court of Appeals for the Federal Circuit

The CAFC set to work almost immediately to create a coherent set of rules for the determination of patent infringement and validity proceedings. There was palpable effort in the early cases that passed through the hands of the newly created Court to remove the spectre of monopoly that had dogged many previous decisions. As noted in Chapter V, above, Giles Rich, writing extra-judicially, had stated:

> "The tendency is to call a patent "monopoly" when it is to be invalidated or restricted and to say it is not a monopoly when it is held to be valid and infringed."[75]

---

[72] Weston, *A Comparative Analysis of the Doctrine of Equivalents: Can European Approaches solve an American Dilemma?* (1998) 39 IDEA 35 (hereinafter Weston) at 44.

[73] Noonan, *op cit.* at 719. See also Baum, *op cit.* at 762, who explains that between 1961 and 1973 the Second Circuit held valid only 18% of patents that it considered. For the Eighth Circuit, the result was even worse with only 11% of patents adjudicated not being invalidated. Statistics for the Tenth Circuit in the same period show 70% of patents were held to be valid.

[74] Noonan, *op cit.* at 720.

[75] Rich, *Are Letters Patent Grants of Monopoly?* (1993) 15 Western New England Law Review 239 at 240.

This was clearly seen to be the case by the infant Court, with Judge Rich leading the charge against misuse of the moniker:

> "The patent system, which antedated the Sherman Act by a century, is not an "exception" to the antitrust laws, and patent rights are not legal monopolies in the antitrust sense of that word. Accordingly, if a patent is held to have been obtained illegally, it is not properly said, ipso facto, that it was all along an illegal monopoly and, thus, that its procurement and attempted enforcement was a per se violation of the antitrust laws. A holding that monopoly analysis should end in favor of liability on a determination of fraud, without more, would signal a fundamental misunderstanding of the substance and purposes of both the patent and the antitrust laws."[76]

In place of the view of patents as limited monopolies, the CAFC cultivated the patent grant as "intangible property, to be maintained free of trespass."[77]

Hughes Aircraft

One of the first cases to reach the CAFC concerning the doctrine of equivalents was *Hughes Aircraft Co. v United States*[78] in 1983. It concerned an invention for controlling the orientation of a communications satellite in orbit (the Williams patent). The claims required means for sending information to earth concerning the current position of the satellite and for receiving and directly executing a control signal sent back to reorient it. The issue at stake was whether advances in semiconductor technology, which allowed positional calculations to be executed *in situ* by microprocessors, took the alleged infringement outside of the scope of Williams.

In the Court of Claims, the trial judge found no literal infringement because there was no means for two-way communication between the satellite and the ground. The Court also refused to find infringement under the doctrine of equivalents since there was no "obvious or exact equivalent"[79] for either the means of sending, or receiving and executing, signals.

The CAFC concluded otherwise, stating that the defendant's spacecraft:

> "are identical with the Williams satellite, except for the employment of sophisticated, post-Williams equipment (computers) to achieve attitude control in the

---

[76] *American Hoist & Derrick Co. v. Sowa & Sons, Inc.*, 725 F.2d 1350 (1984, CAFC) at 1367.

[77] Noonan, *op cit.* at 721, referring to *American Hoist, ibid.*; *Schenck v Nortron Corp.*, 713 F.2d 782 (1983, CAFC); and *Connell v Sears Roebuck & Co.*, 722 F.2d 1542 (1983, CAFC).

[78] 717 F.2d 1351 (1983, CAFC).

[79] 215 U.S.P.Q. 787 at 812, (1982, U.S. Court of Claims) per Judge Colaianni.

> basic manner taught by Williams. Advanced computers and digital communications techniques developed since Williams permit doing on-board a part of what Williams taught as done on the ground. As one of our predecessor courts, the Court of Claims, has thrice made clear, that partial variation in technique, an embellishment made possible by post-Williams technology, does not allow the accused spacecraft to escape the "web of infringement"."[80]

The Court also stressed that the doctrine of equivalents applied to the invention 'as a whole'. Therefore, rather than being forced to find equivalents for each and every claimed element, *Hughes* states that infringement may be found under the doctrine if the accused device is substantially similar (in function, way, and result) to the patented article even if it omits elements of the claimed invention. The Court further opened up the doctrine by saying that elements may be found to be equivalent even if they were not known to be so at the time that the application was filed.[81]

The decision in *Hughes* has received considerable criticism[82] and can be seen as marking the beginning of a period of extreme protectionist policy within the CAFC during which the doctrine of equivalents became one of the most powerful tools of judicial discretion within patent law.[83] It would appear that efforts to address the perceived anti-monopolistic stance of the various Appeal Circuits, and to right the injustices of the previous decades, provided momentum to expand the doctrine at an unprecedented rate. This was not to everyone's liking, the main thrust of criticism levelled against *Hughes* being directed to its seeming non-adherence with the doctrine of 'file-wrapper' estoppel.

File Wrapper Estoppel

Application of the doctrine of equivalents is limited by another important doctrine, that of 'file-wrapper', or 'prosecution history', estoppel. This simply states that the patentee is estopped from using the doctrine of equivalents to reclaim subject matter surrendered in previous prosecution or at the Patent Office to secure the grant.

---

[80] *Hughes Aircraft, op cit.* at 1365.

[81] Indeed, at the time of the filing of the Williams patent, the provision of on-board computational power sufficient to calculate orienting data and issue corrective signals to the boosters was a technical impossibility.

[82] Hantman, *op cit.* at 547 unsurprisingly gives the most thorough dressing down of the decision saying that the decision contradicted all of the Supreme Court's findings of the previous 200 years. See also Noonan, *op cit.* at 732-3

[83] See Weston, *op cit.* at 44.

A simple illustration of the application of the doctrine can be found in the Supreme Court's decision in *Exhibit Supply Co. v Ace Patents Corp.*[84] Here the patent concerned a switch that closed an electric circuit on a pinball table when the target pin was hit by a rolling ball, therefore allowing score to be kept. The application, as originally filed, was drafted rather broadly and called for conductor means "carried by the table". This was, however, rejected by the U.S. Patent Office as conflicting with prior art, so the phrase was replaced by "embedded in the table" to secure the grant of the patent. The owner later brought an infringement action against a competitor who produced tables where the conductor means was carried by, but not embedded in, the table. The patentee alleged that the defendant's modification was equivalent to that claimed by his patent. The Supreme Court decided in favour of the defendant, Chief Justice Stone, giving the opinion of the Court, stated:

> "By the amendment he recognized and emphasized the difference between the two phrases and proclaimed his abandonment of all that is embraced in that difference... The difference which he thus disclaimed must be regarded as material, and since the amendment operates as a disclaimer of that difference it must be strictly construed against him... As the question is one of construction of the claim it is immaterial whether the examiner was right or wrong in rejecting the claim as filed."[85]

This is a thread of argument that has been picked up in the recent *Festo* litigation,[86] and is a subject to which we shall return in due course. However, for the moment it is sufficient to note that the ground of objection in *Hughes* arises from the fact that the majority of the Court ignored Hughes' narrowing of the claims. Several broad claims were deleted and substituted with claims containing limitations directly relevant to the alleged infringement. Noonan, therefore, explains that the "new limitations required a means for providing an indication of the satellite's position to the earth, which was precisely what ... [the alleged infringement] did *not* do."[87]

However, what *Hughes* did do was to institute a "flexible bar" approach to the determination of the effect of amending claims in prosecution. Therefore, the Court

---

[84] 62 S.Ct. 513 (1942, Supreme Court).

[85] *Ibid.* at 519.

[86] *Festo Corporation v Shoketsu Kinzoku Kogyo Kabushiki Co., Ltd*, 234 F.3d 558 (2000, CAFC, *en banc*); 535 U.S. 722, (2002, Supreme Court).

[87] Noonan, *op cit.* at 733.

stated that file-wrapper estoppel may have a limiting effect on the doctrine of equivalents "within a spectrum ranging from great to small to zero."[88] However, it did not necessarily preclude the application of equivalents protection to the element in question. "Rather, the range of estoppel extended only so far as would have been necessary to distinguish the scope of prior art asserted by the examiner."[89]

'Reverse' Equivalents – *Texas Instruments*

Three years after the decision in *Hughes* the CAFC had another opportunity to consider the application of the doctrine of equivalents, this time in *Texas Instruments Inc. v United States International Trade Commission.*[90] The case concerned a patent for a handheld calculator owned by Texas Instruments, the claims of which were written in very broad functional language, which could have allowed for a wide interpretation. The patentee brought an action alleging that certain imported calculators fell within the scope of their claims. The Court agreed that the claim wording could be read onto the allegedly infringing devices, but considered that they were so far improved from the claimed invention that:

> "[T]he total of the technological changes beyond what the inventors disclosed transcends the equitable limits illustrated, for example, in Graver Tank, ... [etc.,] and propels the accused devices beyond a just scope of the ... claims."[91]

Therefore, the device as a whole was considered to be so far changed "in principle from the patented article that it perform[ed] the same or a similar function in a substantially different way".[92] The survival of the restrictive doctrine of equivalents was thus acknowledged and the 'as a whole' test, used in both the expansive and restrictive tests was, once more, confirmed as correct.

Narrowing the Doctrine

The 1980s were a period of great economic growth in both the United States and Europe. Industry flourished, and so did the doctrine of equivalents. However, just as

---

[88] Hughes, *op cit.* at 1363.

[89] Atkinson, Rose & Wasleff, *Was Festo Really Necessary? (2001) 83 JPTOS 111* at 118.

[90] *805 F.2d 1558* (1986, CAFC).

[91] *Ibid.* at 1571.

[92] *Graver Tank*, *op cit.* at 608-9

the economy was to crash at the end of the decade, so the 'as a whole test' used in the application of the doctrine of equivalents was also to meet an untimely end.

Pennwalt Corp. v Durand-Wayland Inc.

Despite beginning the decade as one of the most powerful devices of judicial discretion in patent law, by the end of the 1980s the doctrine of equivalents was a shadow of its former self, and it appeared that it may be phased out in the interests of predictability. The runaway liberalism of the CAFC in its early years, evidenced by decisions like that in *Hughes*, was brought to an abrupt end in the *en banc*[93] decision of *Pennwalt Corp. v Durand-Wayland Inc.*[94]

The patent in question concerned an apparatus for sorting fruit by weight, colour, or both. It contained claims in which each element of the invention was represented as a means for performing a particular function. The alleged infringements embodied most, but not all, of the functions of the patented article. Specifically, the accused devices were found to have no ""indicating means" to determine positions of the items to be sorted",[95] nor their functional equivalent, [96] as a microprocessor stored weight and colour data, not the positions of the items to be sorted. This therefore negated finding literal infringement.

The Court moved on to the question of infringement under the doctrine of equivalents reminding the parties that:

> "[T]he doctrine of equivalents is designed to do equity, and to relieve an inventor from a semantic strait jacket when equity requires, it is not designed to permit wholesale redrafting of a claim to cover non-equivalent devices, i.e., to permit a claim expansion that would encompass more than an insubstantial change."[97]

---

[93] i.e. judged by the full bench, a session whereby the entire membership of the Court (12 judges in the Federal Circuit) participates in the decision rather than the regular quorum.

[94] *833 F.2d 931* (1987, CAFC).

[95] *Ibid.* at 935.

[96] Due to the fact that the claims of the patent were drafted in 'means-plus-function' format recourse to s.112(6) was necessary to determine literal infringement.

[97] *Ibid.* at 935, quoting from *Perkin-Elmer Corp. v Westinghouse Elec. Corp.*, *822 F.2d 1528* (1987, CAFC) at 1352.

Having dispensed this advice, the majority proceeded to find the patent not infringed. In coming to this conclusion the Court did not consider whether the claimed invention and the accused devices were equivalent 'as a whole', as had been previous practice, but instead introduced a new test for determining equivalency. It used an 'all elements', or 'element-by-element' analysis stating that if even one element of the claim limitations is missing in an accused device there can be no finding of equivalency.

> "In sum, the term "equivalents" in the "doctrine of equivalents" refers to "equivalents" of the elements of the claim, not "equivalents" of the claimed invention. While a device found to be an infringement under the doctrine of equivalents is, in a sense, "equivalent" to the claimed invention, that conclusion follows from application of the doctrine. It is not the equivalency determination to which the doctrine is directed, but the result thereof. To speak of a device as being an "equivalent" of the patented invention muddles the analysis."[98]

The dissent was strong and to the point. Senior Circuit Judge Bennett stated

> "[T]he majority has made shortsighted policy choices. The majority has contrived an analytical framework for the doctrine of equivalents that is little more than a redundant literal infringement inquiry, which renders the doctrine of equivalents so unduly restrictive and inflexible as to end its usefulness as judicial doctrine."[99]

He continued:

> "[I]n practical effect, the majority has eviscerated the underlying rationale of the Graver Tank test by requiring, under the doctrine of equivalents, an exact equivalent for each element of the claimed invention. The majority in fact commends ... [a test that] was never the extent of the doctrine of equivalents analysis under our here-ignored precedents which also required that the analysis be undertaken in light of the entirety of the accused device and entirety of the patent-in-suit."[100]

By applying the 'element-by-element' test, the majority took a strict peripheral view of the claims, thereby narrowing the effect of the doctrine. Takenaka suggests that the reason for this restriction lay in confusion with s.112(6) equivalents, the 'all-elements' test being intrinsic to the statutory approach.[101] She points out that an examination on an element-by-element basis "not a proper means of evaluating the modification because the patent is granted for an entire combination of elements, not for each individual element."[102] Indeed, reducing the scope of protection 'out of the blue' in the

---

[98] *Ibid.* at 953.

[99] *Ibid.* at 939-40.

[100] *Ibid.* at 940. The "here-ignored precedents" being *Martin v Barber*, 755 F.2d 1564 (1985, CAFC); *Carman Industries Inc. v Wahl*, 724 F.2d 932 (1983, CAFC), and *Hughes*, *op cit.*

[101] By Takenaka, *Interpreting Claims*, *op cit.* at 20.

[102] *Ibid.* at 21.

manner that the CAFC did in *Pennwalt* fails to support patent policy on two fronts. First, confinement of the doctrine of equivalents in this manner was justified in the name of certainty; however, radical alteration of 'accepted' interpretative practices introduces its own uncertainty, unacknowledged by the majority in the case. This sub-layer arises because of the business practices that have arisen in and around the judicial sphere and are connected with the application of known rules to the claims in hand. Alteration of these rules necessarily gives rise to uncertain practices until their proper scope is established. As patent law does not allow the redrafting of claims based on old principles when those principles change, the result is a glut of patents drafted with differing purposes in mind being interpreted as though they were consistent. When a similar change is implemented by statute transitional provisions govern the change, however, this is not the case with paradigm shifts in judicial reasoning. The alteration in *Pennwalt* therefore fails patent policy on the grounds of certainty. In addition, by curtailing the scope of protection in this manner, the act of change, in itself, fails policy on the grounds of fairness to the patentee.

After *Pennwalt*

Pennwalt ignited a bitter argument created by the obvious tensions between fair protection and public notice. The strong dissent by four of the panel found reflection in wildly divergent opinions in the lower Courts, some applying the element-by-element rule so strictly that there was little to differentiate it from a test of literal infringement.[103] The confusion surrounding application of the doctrine of equivalents was further enhanced by the fact that the next case decided by the CAFC opened it up once more. Utilising similar reasoning to the majority in *Pennwalt*, the Court in *Corning Glass*[104] relaxed the application of the all element rule by clarifying, some would say redefining,[105] what is meant by an element in a claim.

The defendant in the case argued that their device was not equivalent to the patentee's as it lacked an element found in the claim, thereby advocating an equivalency of

---

[103] See, for example, *Safe Flight Instrument Corp. v Sunstrand Data Control Inc.*, 706 F.Supp. 1146 (1989, United States District Court, Delaware). See also, Takenaka, *Interpreting Claims*, *op cit.* at 21-2

[104] *Corning Glass Works v Sumitomo Electric*, 868 F.2d 1251 (1989, CAFC).

[105] See, for example, Player, *Elemental Equivalence: Interpreting 'Substantially the Same Way' under Pennwalt – Taken in Light of Corning Glass*, [1989] EIPR 421.

component approach consistent with the reasoning in *Pennwalt.* The Court, however, rejected this argument, stating:

> ""Element" may be used to mean a single limitation, but it has also been used to mean a series of limitations which, taken together, make up a component of the claimed invention. In the All Elements rule, "element" is used in the sense of a limitation of a claim... [The defendant's] analysis is faulty in that it would require equivalency in components, that is, the substitution of something in the core for the absent dopant. However, the determination of equivalency is not subject to such a rigid formula. An equivalent must be found for every limitation of the claim somewhere in an accused device, but not necessarily in a corresponding component, although that is generally the case."[106]

The combined effect of *Pennwalt* and *Corning Glass* was inconsistent application of the two differing standards. It was therefore something of a relief when the Supreme Court finally came to address the problem of the doctrine of equivalents once more in the 1997 case *Warner-Jenkinson v Hilton Davis.*[107]

Warner-Jenkinson: The Supreme Court Revisits Equivalents

Warner-Jenkinson was the first case concerning the doctrine of equivalents to come before the Supreme Court since the landmark decision of *Graver Tank.* As such, it was of great significance. In its deliberations the Court took time to consider whether to limit, or even delete, the doctrine, and assuming its survival, how the test for equivalents should be phrased so as to avoid some of the uncertainty and distrust of the previous decade.

Death of the Doctrine?

Justice Thomas, delivering the opinion of a unanimous Court, got straight to the point, opening his judgment by stating:

> "Nearly 50 years ago, this Court in [*Graver Tank*] ... set out the modern contours of what is known in patent law as the "doctrine of equivalents." ... [The] Petitioner, which was found to have infringed upon respondent's patent under the doctrine of equivalents, invites us to speak the death of that doctrine. We decline that invitation."[108]

---

[106] *Corning Glass*, 868 F.2d 1251 (1989, CAFC) at 1259.

[107] *Warner-Jenkinson Co., Inc. v Hilton Davis Chemical Co.*, 520 U.S. 17 (1997, Supreme Court).

[108] *Ibid.* at 21. It is significant that none of the 21 judges in the Supreme Court and CAFC who ruled on the matter disputed the existence of the doctrine. Further, at 28, the Court considered that "Congress can legislate the doctrine of equivalents out of existence any time it chooses. The various policy arguments [concerning its abolition] made by both sides are thus best addressed to Congress, not this Court."

However, the Court then continued, lamenting the confusion that had arisen over the operation of the doctrine and stating that it would endeavour to clarify its scope, stating that:

> "[T]he doctrine of equivalents, as it has come to be applied since *Graver Tank*, has taken on a life of its own, unbounded by the patent claims. There can be no denying that the doctrine of equivalents, when applied broadly, conflicts with the definitional and public-notice functions of the statutory claiming requirement."[109] (emphasis supplied)

It quoted the dissenting opinion of Judge Nies (dissenting) in the CAFC's opinion in the case, stating that one means of avoiding the conflict could be found if a distinction was drawn, that was not too esoteric, between:

> "...substitution of an equivalent for a component *in* an invention and enlarging the metes and bounds of the invention *beyond* what is claimed... Where a claim to an invention is expressed as a combination of elements, as here, 'equivalents' in the sobriquet 'Doctrine of Equivalents' refers to the equivalency of an *element* or *part* of the invention with one that is substituted in the accused product or process... This view that the accused device or process must be more than 'equivalent' *overall* reconciles the Supreme Court's position on infringement by equivalents with its concurrent statements that 'the courts have no right to enlarge a patent beyond the scope of its claims as allowed by the Patent Office.' [Citations omitted.] The 'scope' is not enlarged if courts do not go beyond the substitution of equivalent elements."[110] (emphasis in original).

And continued:

> "We concur with this apt reconciliation of our two lines of precedent. Each element contained in a patent claim is deemed material to defining the scope of the patented invention, and thus the doctrine of equivalents must be applied to individual elements of the claim, not to the invention as a whole. It is important to ensure that the application of the doctrine, even as to an individual element, is not allowed such broad play as to effectively eliminate that element in its entirety."[111]

The Court therefore confirmed the 'all element rule' as governing the application of the doctrine of equivalents and prevented expansion of the scope of protection beyond that which could be deduced from the claims. As we shall see in Chapter VII, below, the alternative formulation, adopting the pre-*Pennwalt* approach to interpretation and applying the 'invention as a whole' rule, is startlingly similar to the traditional German practice of determining scope by reference to the 'general inventive idea'. Given the

---

[109] *Ibid.* at 28-9.

[110] *Ibid.* at 29. Quoting from 62 F.3d 1512, at 1573-4 (1995, CAFC) Nies, J., dissenting.

[111] *Warner-Jenkinson* (Supreme Court), *op cit.* at 29.

fact that American practice is now firmly founded in 'peripheral definition theory' it would have been surprising if the Supreme Court had adopted a broader formulation based on the invention as a whole. However, the Court did not stop its analysis here, and, true to its word, continued to consider the limitations of the doctrine in more detail in order to help define its scope.

File-Wrapper Estoppel

On the matter of file-wrapper estoppel, the Court rejected the petitioner's argument that the mere fact that an amendment had been made in the course the prosecution history should precluded use of the doctrine of equivalents. It explained that prior cases had consistently applied file-wrapper estoppel only where the claims had been amended for a limited set of reasons, and that it could see no reason to require a more rigid rule which did away with the right of the patentee to explain the change made. However:

> "Where the patent holder is unable to establish such a purpose, a court should presume that the purpose behind the required amendment is such that prosecution history estoppel would apply."[112]

Therefore, where the reason for the change is considered sufficient, estoppel may be avoided. However, the burden is on the patentee, and in the absence of good reason the presumption is that the Patent Office had a substantial reason related to patentability for including the limiting element added by amendment. In such circumstances, the Court considered that prosecution history estoppel would bar application of the doctrine equivalents to that element.[113]

Intent of the Defendant

Warner-Jenkinson is also significant in confirming that it is not permissible to consider the intention of the defendant when deciding on the questions of infringement. The defendant had argued that the seeming reliance on the absence of independent experimentation in *Graver Tank* created an equitable defence where such experimentation had, in fact, taken place. The CAFC in *Warner-Jenkinson* had endorsed the proposition, explaining that the alleged infringers' behaviour was an indirect reflection of the substantiality of differences between the patented invention and the accused device or process:

---

[112] *Ibid.* at 41.

[113] *Ibid.*

> "[A] person aiming to copy or aiming to avoid a patent is imagined to be at least marginally skilled at copying or avoidance, and thus intentional copying raises an inference – rebuttable by proof of independent development – of having only insubstantial differences, and intentionally designing around a patent claim raises an inference of substantial differences."[114]

This was not an opinion that the Supreme Court shared.

> "At a minimum, one wonders how ever to distinguish between the intentional copyist making minor changes to lower the risk of legal action, and the incremental innovator designing around the claims, yet seeking to capture as much as is permissible of the patented advance."[115]

The references to independent research in *Graver Tank* therefore merely assisted the discussion of known interchangeability between the chemical compound claimed in the patent and the compound substituted by the alleged infringer. The Court reasoned that a positive response to the question of independent experimentation:

> "would not always reflect upon the objective question whether a person skilled in the art would have known of the interchangeability between two elements, but in many cases it would likely be probative of such knowledge."[116]

It therefore concluded that although *Graver Tank* left room for the inclusion of intent based elements in the doctrine of equivalents, it could not be read as requiring them:

> "The better view, and the one consistent with *Graver Tank's* predecessors and the objective approach to infringement, is that intent plays no role in the application of the doctrine of equivalents."[117]

After Arising Equivalents?

The petitioner had also argued that, in order to be consistent with the notice function of patent claims and to minimise any conflict that may arise, the doctrine of equivalents should be limited, at the very least, to equivalents known at the time of issue, and more realistically to equivalents actually disclosed in the patent. The Court declined to accept this approach, stating that the knowledge of interchangeability was not relevant for its own sake, but rather for what it tells the fact finder about the similarities between elements. It reasoned that:

---

[114] *Ibid.* at 35, referring to the CAFC decision in the case. See note 110, above.

[115] *Ibid.*

[116] *Ibid.* at 36.

[117] *Ibid.*

> "[T]he perspective of a skilled practitioner provides content to, and limits on, the concept of 'equivalence' and that the proper time for assessing the known interchangeability of elements was at the time of infringement, and not before."[118]

Thus, the Court refused to restrict the patent's effect to the state of the art at the time of filing, or even grant, reasoning that the objective nature of the test required the assessment to be made in the light of what it taught at the time of infringement. As such, the Court married the scope of the patent to the standard for inventiveness, and provided reward to the extent of the patentee's contribution to the art. This, in itself, is significant as it provides the final piece to the jigsaw created by the expansive doctrine of equivalents and the patentability standard, and additionally gives justification to the 'reverse' or 'narrowing' doctrine of equivalents.[119]

A Test for Equivalence?

Finally, the Court addressed the debate concerning the linguistic framework under which equivalence is determined. It noted the accepted problems of the 'triple identity test' in analysing products or processes that are not mechanical in nature. Further, it acknowledged that an 'insubstantial difference' test offers "little additional guidance as to what might render any given difference 'insubstantial'," [120] before stating that the particular linguistic framework used was less important than whether the test was probative of the essential enquiry:

> "Does the accused product or process contain elements identical or equivalent to each claimed element of the patented invention?"[121]

In answer to this question, the Court suggested that different linguistic frameworks would suit different factual situations and that a focus on the role played by individual elements in the context of a specific claim will inform the inquiry. However, it refrained from going further "and micro managing the Federal Circuit's particular word choice for analyzing equivalence." Preferring to leave the CAFC free to "refine the

---

[118] *Ibid.*

[119] Where infringement can be avoided if alleged infringement was so far changed "in principle from the patented article that it performs the same or a similar function in a substantially different way." *Graver Tank*, *op cit.* at 608-9.

[120] *Warner-Jenkinson*, (Supreme Court), *op cit.* at 40.

[121] *Ibid.*

formulation of the test for equivalence in the orderly course of case-by-case determinations."[122]

Mani-*Festo* for the Future?

At the time that the Supreme Court was considering the appeal in *Warner-Jenkinson*, another case was rumbling in the background. The *Festo* litigation had already been from first instance to Supreme Court once,[123] where it was remanded for reconsideration in light of *Warner-Jenkinson*. The litigation had now reached the CAFC for the second time, which, due to the importance of the issues at stake, had vacated their earlier decision and granted the defendant's request for rehearing *en banc*. The *en banc* decision of the Court was delivered on the 29th November, 2000, and was set to rock the patent community to its very foundations. Indeed, such was the effect of the judgment that it caused one commentator to proclaim "the doctrine of equivalents is dead, dead, dead."[124] Furthermore, Wegner, in a recent article, brands *Festo* a "patent law nightmare" that has caused damage to the "fabric of infringement law".[125] Others, whilst not being quite so melodramatic, reflect the gravity of the situation nonetheless, stating that "the Festo decision may have transformed prosecution history estoppel into an exception that swallows the rule."[126]

The Problem Identified

The Festo litigation concerns two patents for magnetic rodless cylinders composed of three basic parts: a piston, a cylinder, and a sleeve. They were the U.S. counterparts of German applications. Justice Schall, giving judgment in the CAFC in the following terms, describes the basic operation of the invention:

> "...[T]he piston is on the inside of the cylinder, and is moved by fluid under pressure. The sleeve is on the outside of the cylinder, and is magnetically coupled to the piston. The magnetic attraction between the sleeve and the piston causes the sleeve to follow the piston when it moves along the inside of the cylinder. The sleeve is used to move objects on a conveying system."[127]

---

[122] *Ibid.*

[123] *Festo Corporation v Shoketsu Kinzoku Kogyo Kabushiki Co., Ltd*, 520 U.S. 1111 (1997, Supreme Court).

[124] Hosteny, *Does Festo Change Patent Prosecution?* [2001] (May) IP Today 44 at 44.

[125] Wegner, *Festering Questions After Festo*, (2003) 13 Fordham Intellectual Property, Media and Entertainment Law Journal 891, at 891, 907.

[126] Atkinson, Rose & Wasleff, *Was Festo Really Necessary?* (2001) 83 JPTOS 111 at 111.

[127] 234 F.3d 558 (2000, CAFC, *en banc*) at 579.

The allegedly infringing articles differed from the patent in a number of areas. Specifically, where the patent claimed a device with a pair of sealing rings, the defendant's products contained only a single resilient two-way sealing ring.[128] In addition, the defendant's piston sleeve was made of aluminium, whereas the patent called for one made from magnetizable material (aluminium is non-magnetizable). Therefore, the articles did not fall within the literal scope of the claims, but infringement was found under the doctrine of equivalents.

Such is not controversial. The problem with the case, however, stems from amendments made during prosecution before the U.S. Patent and Trademark Office (the USPTO), which gave rise to prosecution history estoppel. The *en banc* Court requested briefs on five questions for the rehearing, all of which concerned the operation of this bar to application of the doctrine of equivalents. Justice Schall summarises the questions as follows:

> "1. For the purposes of determining whether an amendment to a claim creates prosecution history estoppel, is "a substantial reason related to patentability," [citation omitted] ... [as required by Warner-Jenkinson] limited to those amendments made to overcome prior art under §102 and §103 [novelty and inventive step], or does "patentability" mean any reason affecting the issuance of a patent?
>
> 2. Under Warner-Jenkinson, should a "voluntary" claim amendment – one not required by the examiner or made in response to a rejection by an examiner for a stated reason –create prosecution history estoppel?
>
> 3. If a claim amendment creates prosecution history estoppel, under Warner-Jenkinson what range of equivalents, if any, is available under the doctrine of equivalents for the claim element so amended?
>
> 4. When "no explanation [for a claim amendment] is established," [citation omitted] ... thus invoking the presumption of prosecution history estoppel under Warner-Jenkinson, what range of equivalents, if any, is available under the doctrine of equivalents for the claim element so amended?
>
> 5. Would a judgment of infringement in this case violate Warner-Jenkinson's requirement that the application of the doctrine of equivalents "is not allowed such broad play as to eliminate [an] element in its entirety," [citation omitted]. In other words, would such a judgment of infringement, post Warner-Jenkinson, violate the "all elements" rule?"[129]

The majority answers were stark.

---

[128] The Court explains the difference between the two in the following manner: "A sealing ring has a lip on only one side of the ring that seals against fluid flow on that side. By contrast, a two-way sealing ring has a lip on both sides of the ring that allows each side to seal against fluid flow." *Ibid.* at 582.

[129] *Ibid.* at 563.

Judgment in the CAFC

The Court began by examining the function of the doctrine of equivalents in patent law. Referring to *Graver Tank*, Justice Schall, giving the opinion of the Court, stated that it operates to prevent the:

> "...accused infringer from avoiding liability for infringement by changing only minor or insubstantial details of a claimed invention while retaining the invention's essential identity."[130]

In undertaking this task, however, he noted that a balance must be struck between ensuring that patentee enjoys their just reward and ensuring that the claims give "fair notice" to third parties of the patent's scope. This balance could be easily upset because, in the words of the Supreme Court in *Warner-Jenkinson*:

> "...the doctrine of equivalents, when applied broadly, conflicts with the definitional and public-notice functions of the statutory claiming requirement."[131]

He continued:

> "Prosecution history estoppel is one tool that prevents the doctrine of equivalents from vitiating the notice function of claims... [It] precludes a patentee from obtaining under the doctrine of equivalents coverage of subject matter that has been relinquished during the prosecution of its patent application... Therefore, "[t]he doctrine of equivalents is subservient to ... [prosecution history] estoppel.""[132] [citations omitted]

With these points in mind, the Court then proceeded to consider the answers to the questions posed. In respect of the first, it held that "a substantial reason related to patentability" was not limited to the avoidance of prior art, but also included any other reason related to the statutory requirements for patentability:

> "Therefore, an amendment that narrows the scope of a claim for any reason related to the statutory requirements for a patent will give rise to prosecution history estoppel with respect to the amended claim element."[133]

In answer to the second question, the Court considered that voluntary amendments should be treated in the same manner as other amendments:

---

[130] *Ibid.* at 564. Referring to *Graver Tank*, *339 U.S. 605* (1949, Supreme Court) at 608.

[131] *Ibid.* Referring to *Warner-Jenkinson*, *520 U.S. 17* (1997, Supreme Court) at 29.

[132] *Ibid.*

[133] *Ibid.* at 566.

> "[T]herefore, any voluntary amendment that narrows the scope of a claim for a reason related to the statutory requirements for a patent will give rise to prosecution history estoppel with respect to the amended claim element... [As b]oth voluntary amendments and amendments required by the Patent Office signal to the public that subject matter has been surrendered."[134]

The Court therefore clearly views the doctrine of equivalents as an exception to the general rules of interpretation, to be strictly controlled. This conclusion is further highlighted by reference to the Court's answer to the third *en banc* question.

> "When a claim amendment creates prosecution history estoppel with regard to a claim element, there is no range of equivalents available for the amended claim element. Application of the doctrine of equivalents to the claim element is completely barred (a "complete bar")."[135]

The answer to the third question has been described as the "heart of the Festo opinion"[136] as the 'flexible bar' approach of the past was swept aside in favour of the far more restrictive 'complete bar' to the application of the doctrine of equivalents. The Court stating:

> "Our decision to reject the flexible bar approach adopted in [*Hughes*] ... comes after nearly twenty years of experience in performing our role as the sole court of appeals for patent matters. In those years, *the notice function of patent claims has become paramount*, and the need for certainty as to the scope of patent protection has been emphasized. A problem with the flexible bar approach is that it is virtually impossible to predict before the decision on appeal where the line of surrender is drawn.
>
> ...After our long experience with the flexible bar approach, we conclude that its "workability" is flawed."[137] (emphasis supplied)

The Court continued, extolling the virtues of the "complete bar" approach in lending certainty to the process of determining the scope of protection conferred by a patent.

> "With a complete bar, both the public and the patentee know that once an element of a claim is narrowed by amendment for a reason related to patentability, that element's scope of coverage will not extend beyond its literal terms. There is no speculation or uncertainty as to the exact range of equivalents that might be available. This certainty aids both the public and the patentee in ascertaining the true scope and value of the patent without having to resort to litigation to obtain a case by case analysis of what subject matter the claims can cover. With a complete bar, neither the public nor the patentee is required to pay the transaction costs of litigation in order to

---

[134] *Ibid.* at 568.

[135] *Ibid.* at 569.

[136] By Wharton, *Festo and the Complete Bar: What's left of the Doctrine of Equivalents?* (2001) 20 Saint Louis University Public Law Review 281 at 287.

[137] *Ibid.* at 574-5.

> determine the exact scope of subject matter the patentee abandoned when the patentee amended the claim."[138]

Furthermore, in answer to the fourth question, the Court stated that no range of equivalents would be available where no explanation for a claim amendment was established.[139] Therefore, further extending the 'complete bar' rule. Due to its answers to the preceding questions, the Court found no need to reach a decision in relation to question 5.

Fallout

By answering the *en banc* questions in this manner, the CAFC caused uproar in patent circles. The primary criticism came from the establishment of the 'complete bar' approach whereby any amendment related to patentability would automatically preclude application of the doctrine of equivalents to that element. As noted in Chapter IV, above, the standard practice of those drafting patent claims is to begin broad and amend as, and when, necessary to narrow the scope of protection during prosecution. This approach is a product of many factors, including the stage in the innovative process at which the patent application is made and the position of known prior art in relation to the invention. Therefore, those patents that were drafted prior to the decision in *Festo* almost invariably suffered from amendments of some kind related to patentability due simply to the nature of the drafting process. In making its statement on the complete nature of the bar, the Court failed to consider the penalties that this 'certainty' would impose upon those patents in force at the time of the judgment.

The problems arise due to the effects that prior rules had on the system surrounding the interpretation of patent documents. The interpretation that will be placed on the claims of a patent is but one of a number of factors that govern the effective scope of protection. Institutional practices augmenting the Court's approach to the determination of patent scope rely on consistency for their operation. Patents are drafted in the expectation that they will be interpreted in a certain way. Therefore, criticism of the *Festo* decision is not criticism directed to the future effects on drafting, but rather to the seismic shift in the *status quo* that renders past inventive effort devoid of reward.

---

[138] *Ibid.* at 577.

[139] *Ibid.* at 578.

The effect of the CAFC's decision was to provide a patentee's competitors with a charter to infringe. All that they need do was order a copy of the patent and the prosecution history, isolate those areas in which amendment was made and substitute functional equivalents for those elements. The apparent policy justifications for patent protection were changed overnight as the 'public notice' function gained prominence. Therefore, patents drafted with all due care and diligence based on the Court's previous practice found themselves, after *Festo*, robbed of the scope that they would once have enjoyed. Thus, it is unsurprising that the Supreme Court was, once again called in to decide the issue.

Festo in the Supreme Court (Again)

After considering the history of the case, the Supreme Court began its discussion of the substantive elements of the appeal by examining the policy considerations that lay behind the operation of the doctrine of equivalents. The tone of the judgment is clear from the outset:

> "The patent laws "promote the Progress of Science and useful Arts" by *rewarding* innovation with a temporary monopoly... [T]he nature of language makes it impossible to capture the essence of a thing in a patent application. The inventor who chooses to patent an invention and disclose it to the public, rather than exploit it in secret, bears the risk that others will devote their efforts toward exploiting the limits of the patent's language... The language in the patent claims may not capture every nuance of the invention or describe with complete precision the range of its novelty. *If patents were always interpreted by their literal terms, their value would be greatly diminished.*"[140] (emphasis supplied)

Therefore, the Court explained that the doctrine of equivalents has evolved to combat this devaluation by simple acts of copying where unimportant and insubstantial substitutes for certain elements have been made. Uncertainty is "the price of ensuring the appropriate incentives for innovation," and the Supreme Court has consistently "affirmed the doctrine over dissents that urged a more certain rule"[141]

With these points in mind, the Court proceeded to consider the limits placed upon the operation of the doctrine by prosecution history estoppel.

> "Prosecution history estoppel ensures that the doctrine of equivalents remains tied to its underlying purpose. Where the original application once embraced

[140] *535 U.S. 722* (2002, Supreme Court) at 731.

[141] *Ibid.* at 732.

> the purported equivalent but the patentee narrowed his claims to obtain the patent or to protect its validity, the patentee cannot assert that he lacked the words to describe the subject matter in question. The doctrine of equivalents is premised on language's inability to capture the essence of innovation, but a prior application describing the precise element at issue undercuts that premise. In that instance the prosecution history has established that the inventor turned his attention to the subject matter in question, knew the words for both the broader and narrower claim, and affirmatively chose the latter."[142]

It confirmed that estoppel would arise where an amendment made to secure the patent resulted in a narrowing of its scope. However, it rejected the 'complete bar' rule suggested by the CAFC, stating that this approach was:

> "inconsistent with the purpose of applying the estoppel in the first place – to hold the inventor to the representations made during the application process and to the inferences that may reasonably be drawn from the amendment. By amending the application, the inventor is deemed to concede that the patent does not extend as far as the original claim. It does not follow, however, that the amended claim becomes so perfect in its description that no one could devise an equivalent."[143]

To hold otherwise would be to resort to the "very literalism the equivalents rule is designed to overcome."[144] The Court then stressed that both the doctrine of equivalents and prosecution history estoppel were "settled law":

> "The responsibility for changing them rests with Congress... Fundamental alterations in these rules risk destroying the legitimate expectations of inventors in their property."[145]

Comment

By rejecting the 'complete bar' rule, the Supreme Court clearly recognises the effect that such a shift in legitimate expectations of both patentee and their competitors would have on the process of innovation *already instigated* under the patent system. It is clear that the assessment and determination of scope cannot be isolated from those grants *already in existence*, which have had their intrinsic scope[146] determined by the legitimate expectations of their drafters. The importance of the doctrine of equivalents in the United States is thus primarily related to the effect that it has on patents in operation, rather than the prospective effect that it may have on patents in the future. The

---

[142] *Ibid.* at 734-5.

[143] *Ibid.* at 737-8.

[144] *Ibid.* at 738.

[145] *Ibid.* at 739.

[146] i.e. the scope with which they have been drafted.

American experience therefore highlights one of the paradoxes inherent in 'designing' a better, or optimal, patent regime. The act of change, in itself, is incompatible with many of the aims of, and justifications for, the system. As Machlup stated in his review of the U.S. Patent system in the 1950s:

> "...If we did not have a patent system, it would be irresponsible, on the basis of our present knowledge of its economic consequences, to recommend instituting one. But since we have had a patent system for a long time, it would be irresponsible, on the basis of our current knowledge, to recommend abolishing it."[147]

The same can be said instituting the sort of *ad hoc* amendments to current practice that the CAFC did in *Festo*. The quest for certainty and predictability undertaken by the Court is admirable, however, given the *status quo* before *Festo*, the CAFC's approach was reckless. 'Certainty' means more than predictable patents, in common law jurisdictions it also means predictable litigation based firmly on precedent. The Federal Circuit's decision in *Festo* not only evidences a change of favour for patents, withdrawing from the Court's early pro-patent policy, but also flies in the face of clear precedent.

Such was the outcry over the ruling that it is unsurprising that the Supreme Court acted as it did, condemning the junior Court's actions. However, the story does not end here. On 26th September, 2003, an *en banc* CAFC issued judgment in *Festo* for the second time.[148]

Postscript: The CAFC revisits *Festo*

Despite having their previous judgement vacated by the Supreme Court, Judge Lourie, giving the opinion of the Court, began his discussion by reinstating "those holdings of *Festo VI* that were not disturbed by the Supreme Court."[149] He therefore stated that any "narrowing amendment made to comply with any provision of the Patent Act ... may invoke an estoppel." This was to include voluntary, as well as requested, amendments. In addition, the Court 'clarified' that:

---

[147] Machlup, *An Economic Review of the Patent System*, Study No. 15 of the Sub Committee on Patents, Trademarks and Copyrights of the Committee on the Judiciary, U.S. Senate 85th Congress, 2nd Session, (1958; Washington) at 80-1.

[148] Unreported judgment of the CAFC (*en banc*) of 26th September 2003.

[149] *Festo VI* refers to the first *en banc* judgment of the CAFC in the case, reported at 234 F.3d 558 (2000, CAFC, *en banc*).

> "... [T]he Supreme Court's *Warner-Jenkinson* presumption, which treats a narrowing amendment as having been made for a "substantial reason related to patentability" when the record does not reveal the reason for the amendment ... remains intact."

Conceding, however, that the "consequences of failing to overcome that presumption have been altered."

Therefore, the test to be applied was essentially a three-stage assessment. First, did the amendment narrow the literal scope of the claim? If so, then the assessment moves to the second question, if not, prosecution history estoppel does not apply. The second question relates to the reasons for the amendment; was it carried out for a substantial reason relating to patentability? The presumption being that it was. If so, the next step in the analysis is to consider the scope of the subject matter surrendered by the narrowing amendment. The presumption connected with this third-stage being that the patentee has surrendered all of the territory between the original claim and the amended claim. Again, this is subject to rebuttal, the grounds for which are mentioned below.

After setting out these criteria, the Court continues, stating:

> "... [I]f the patentee fails to rebut the *Festo* presumption, then prosecution history estoppel bars the patentee from relying on the doctrine of equivalents for the accused element."

This latter statement therefore reintroduces the 'complete bar' via the operation of a series of presumptions that expand the surrendered territory. This point is emphasised by Judge Newman in her dissent. In addition, she finds the majority's conversion of two of the Supreme Court's three rebuttal criteria into questions of law (from questions of fact) "flawed".

The 'Rebuttal Criteria'

The majority opinion gives the following summary and guidance on how to apply the 'rebuttal criteria'. The first criterion is satisfied where the patentee shows that the alleged equivalent would have been unforeseeable at the time of the amendment, and "thus beyond a fair interpretation of what was surrendered." This is an objective test that requires the Court to ask "whether the alleged equivalent would have been unforeseeable to one of ordinary skill in the art at the time of the amendment." Equivalents will usually be unforeseeable if they represent "later-developed technology",

or "technology that was not known in the relevant art," old technology, while not always so, will be "more likely" to have been foreseeable.

The second criterion:

> "... requires a patentee to demonstrate that "the rationale underlying the narrowing amendment [bore] no more than a tangential relation to the equivalent in question.""

In determining the meaning of "tangential", the Court makes reference to the dictionary definition of the word,[150] before stating that:

> "...much like the inquiry into whether a patentee can rebut the *Warner-Jenkinson* presumption that a narrowing amendment was made for a reason of patentability, the inquiry into whether a patentee can rebut the Festo presumption under the "tangential" criterion focuses on the patentee's objectively apparent reason for the narrowing amendment."

The third, and final, criterion 'clarified' by the Court requires that the patentee establish "some other reason" to explain why they could "not reasonably be expected to have described the insubstantial substitute in question." Judge Lourie, giving the opinion of the majority, stressing that:

> "This category, while vague, must be a narrow one; it is available in order not to totally foreclose a patentee from relying on reasons, other than unforeseeability and tangentialness, to show that it did not surrender the alleged equivalent. Thus, the third criterion may be satisfied when there was some reason, such as the shortcomings of language, why the patentee was prevented from describing the alleged equivalent when it narrowed the claim."

The Potential Effect of the Decision

The effect of the CAFC's 'clarification' of the presumptions and guidance on applying the 'rebuttal criteria' is to return to a position where the 'complete bar' is applied under a different name. The applicant is still at a serious disadvantage if their claims have been the subject of amendment, whatever the reason, at some point during the application process. As Judge Rader, in a concurring opinion, notes:

---

[150] Stating, "The American Heritage College Dictionary 1385 (3d ed. 1997) (defining "tangential" as "[m]erely touching or slightly connected" or "[o]nly superficially relevant; divergent"); 2 The New Shorter Oxford English Dictionary 3215-16 (1993) (defining "tangential" as "merely touch[ing] a subject or matter; peripheral")."

> "... at the pace of these changes in fundamental patent law, the noble objective of bringing more certainty to the doctrine of equivalents nonetheless exacts a price in unintended consequences... [T]he Supreme Court's stringent estoppel presumptions also entail considerable unanticipated arbitrariness because examiners differ. Some examiners aggressively seek to narrow and define claims. Others demand far fewer amendments. Thus the application of the forfeiture presumption often depends on the luck of the examiner draw. In any event, the new certainty rules for equivalents (a rebuttable presumption that narrowing amendments erect a complete bar), at least for a period of time, may disrupt as much certainty as they provide. In particular, these new rules are likely to influence both the patent acquisition and enforcement processes in unpredictable ways."

The point is therefore made that it is the pace of doctrinal change that causes the problems. The patent system as a whole, including the procedure of issue, the technique of drafting, and the interpretation of claims, is internally slow to respond to external changes imposed upon it by decisions such as *Festo*. Therefore, paradoxically, the quest for certainty that is being undertaken by the CAFC in the case is, in itself, responsible for "disrupting the fundamental principle of certainty in the scope of patent claims."[151]

The message is therefore clear: The perceived attitude of the courts (in the U.S. especially the CAFC), is a far more accurate measure of the scope that will be given to any litigated patent than any of the economic or theoretical 'justifications' or models of the system considered above. The responses of society as a whole will, eventually, remedy any changes in interpretative standards as business practices, litigation, and even patenting itself, strive to maintain the *status quo*.[152] With doctrinal shifts of the size and type displayed in *Festo*, the patenting business is essentially a lottery. There are big prizes for the winners, but equally big risks too.

Therefore, with this in mind, we now turn our attention to consider a position lying at the other end of the spectrum, from the restrictive *Festo* doctrine, as we look at the

---

[151] Per Judge Rader, delivering concurring opinion in the CAFC's recent *Festo* decision.

[152] Indeed, in the aftermath of the CAFC's original *en banc* decision in *Festo*, articles such as Hosteny, *Does Festo Change Patent Prosecution? [2001] (May) IP Today 44* sprang up giving advice on avoiding the *Festo* pitfalls.

German patent system, traditionally characterised as offering broad protection to the 'general inventive idea'.

CHAPTER VII

Germany

-

A Tradition of Expansive Interpretation

Preface

Europe has one patent system, a supposedly homogenised grant and opposition process for the 27 States[1] that contract to the European Patent Convention (the EPC). In addition, the EPC also boldly legislates for the scope that these grants are to enjoy once created. Yet without a common appeal court to act as final arbiter in matters relating to the determination of the breadth of protection, a history of wildly differing interpretative styles has rendered any harmonisation on this latter ground incomplete. We have already seen the United Kingdom's traditional approach to claim interpretation, and now in the second of three chapters on comparative aspects of patent scope we turn our attention to one of the UK's closest, and yet in this arena most distant, neighbours: Germany.

The traditional view of the German patent system is that it lies in diametric opposition to that of the United Kingdom. In almost any text one cares to mention that raises the issue of the interpretation of a British patent, the reader will be referred to decisions of the German courts (most notably, indeed notoriously, the *Epilady* litigation[2]) as a demonstration of European disharmony on the determination of protection scope. This comparison is encouraged, perhaps even engendered to a degree, by the wording of the statutory provisions that govern the interpretation of any patent granted by a signatory country of the EPC; Article 69 and the Protocol on its interpretation.

Article 69 and the Protocol: A Brief History

Article 69 of the (unamended) EPC states that "the extent of protection conferred by a European patent ... shall be determined by the terms[3] of the claims. Nevertheless, the description and drawings shall be used to interpret the claims." This provision is based on Article 8 of the Strasbourg Convention on the harmonisation of substantive patent

---

[1] As of 11th August 2003. The States in question are Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hellenic Republic, Hungary, Ireland, Italy, Liechtenstein, Luxembourg, Monaco, Netherlands, Portugal, Romania, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom.

[2] In the UK *[1990] FSR 181*. The German proceedings are reported at *(1993) 24 IIC 838*.

[3] The corresponding word in the German version of the official text is "inhalt" which roughly translates as 'contents'. It will be noted that this is not entirely concomitant with "terms" in the English version, yet both are considered to be authoritative translations.

law, and had proved to be one of the most difficult provisions to gain agreement over when being drafted in the Council of Europe.[4] The problem stemmed from the wildly differing roles played by the claims of a patent in the Member States at the time, particularly the weight that their wording was given in the determination of the scope of protection. In countries like the UK and Switzerland, the claims formed the periphery of the monopoly.[5] Their interpretation was the key to both the definition of the invention and the extent of protection. In countries like Germany and the Netherlands, however, the claims served only to define the invention, the scope of protection was determined by generalisation of the inventive concept, unhindered by the exact words used in the claims.[6] The drafters of the Convention therefore took what has been described as a "big step"[7] by opting to follow peripheral claim theory rather than central definition theory, and using the claims to mark the boundaries of the patent.

By adopting a formulation whereby the "extent of protection conferred by a ... patent ... shall be determined by the *terms* of the claims"[8] (emphasis added) rather than, for example, the words of the claims, the Council of Europe consciously chose a position somewhat broader than that of pure literal interpretation. This policy decision is made manifest in the records of the drafting Committee, where it is stated that this wording "seeks to lay down a principle for interpreting claims which is somewhere between the system in which claims may be interpreted strictly according to the letter and that in which they do not play a decisive part in defining the limits of protection."[9]

---

[4] See Armitage, *Interpretation of European Patents (Art. 69 EPC and the Protocol on the Interpretation)*, *(1983) 14 IIC 811*, (hereinafter Armitage, *Interpretation of European Patents*) at 813.

[5] Hence the term 'peripheral definition theory' has been applied to the role of the claims in these jurisdictions. See generally, Takenaka, *Interpreting Patent Claims: The United States, Germany and Japan*, Vol. 17 Studies in Industrial Property and Copyright Law (1995; Max Planck Institute for Foreign and International Patent, Copyright and Competition Law, Munich) (hereinafter Takenaka, *Interpreting Claims*).

[6] Thus, giving rise to the term 'central definition theory' – whereby the claims define the core of protection and the scope of protection is determined by extrapolation from this central position. See Takenaka, *Interpreting Claims*, *ibid.*

[7] See Armitage, *Interpretation of European Patents*, *op cit.* at 813.

[8] The French version refers to "teneur des revendications".

[9] Quoted from Armitage, *Interpretation of European Patents*, *op cit.* at 814. See also Armitage, *Origins of Relevant Provisions of the Munich and Luxembourg Conventions*, in Kemp (ed), *Patent Claim Drafting and Interpretation*, (1983; Oyez Longman, London) (hereinafter Kemp) at 7-15. It will be noted that these

The position taken by the Strasbourg Convention was adopted in unchanged form in Article 69 EPC. However, by this time the number of official languages had risen from two to three, the original English and French of Strasbourg being supplemented by German; and the German version of Article 69 was causing some problems. In this incarnation the word 'terms' had been replaced with 'inhalt', which roughly translates as 'contents' and is therefore potentially of wider ambit than the other official language versions. No agreement could be reached over either narrowing the German version or broadening the English and French versions of the official text so as to achieve uniformity, and eventually the varying translations were adopted on the basis that no single text had dominance over the others; all were official. However, due in part to fears over the disharmony that the different wordings may have produced, and also to guard against "extreme interpretation of any one text",[10] a Protocol on the Interpretation of Article 69 EPC was adopted to give guidance to the national court.

The wording of the Protocol is a striking match for the comments of the Committee of the Council of Europe charged with drafting Article 8 of the Strasbourg Convention. It reads:

> "Article 69 should not be interpreted in the sense that the extent of the protection conferred by a European patent is to be understood as that defined by the strict, literal meaning of the wording used in the claims, the description and drawings being employed only for the purpose of resolving an ambiguity found in the claims. Neither should it be interpreted in the sense that the claims serve only as a guideline and that the actual protection conferred may extend to what, from a consideration of the description and drawings by a person skilled in the art, the patentee has contemplated. On the contrary, it is to be interpreted as defining a position between these extremes which combines a fair protection for the patentee with a reasonable degree of certainty for third parties."[11]

Thus, it parodies the traditional British approach to claim interpretation – taking the literal meaning of the words utilised in the claims and limiting the protection accordingly – and the traditional German approach – where the court is unburdened by

---

comments correspond almost exactly to the sentiment of the Protocol on the Interpretation of Article 69 EPC.

[10] Armitage, *Interpretation of European Patents*, *op cit.* at 814.

[11] Robin Jacob, writing in the late 1970s dismissed this last part as a "politicians sentence". See Jacob, *Interpretation of Claims and Infringement*, in Vitoria (ed) *Patents Act 1977*, (1978, Sweet & Maxwell, London), (hereinafter Jacob, *Claims and Infringement*) at 67.

the claims when considering the scope of protection – and suggests a middle ground, balancing the dual virtues of fairness and certainty.

The German patent system has therefore been chosen as a comparison in this work as it traditionally occupies a position that is poles apart from the British in terms of interpretative style. It represents stark contrast to the principle of protection of the public that defined early UK practice, embodying a rather more pro-patentee 'reward-based' philosophy for justification of the grant. The *modern* German approach to determination of patent scope is now substantially harmonised to a pan-European standard by the operation of Article 69 EPC and the Protocol attached thereto. However, as will be seen, the old practices of the courts in this jurisdiction regarding the interpretation of the claims, most notably their insignificance in the determination of the breadth of the grant, provides vivid illustration of an alternative formulation to the 'accepted'[12] norm of pseudo-literal purposive construction, and thus aids in its understanding.

Germany: The Historical Perspective

The current practice of the German courts marks what can be seen as its fourth distinct period in claim interpretation practice. Takenaka summarises the first three periods as follows: "the first period in which claim scope was interpreted to correspond to the scope of patent protection; the second period in which the scope of patent protection was completely liberated from claim language; and the third period in which the scope of the patent protection is expansively interpreted based on the claim language...."[13] The Fourth Period is characterised by increased reliance on the wording of the claims and a consummate narrowing of claim scope compared to that seen in the Second and Third periods. Although prompted by broader EPC harmonisation measures,[14] this current trend can clearly be seen to parallel a similar push towards a more clearly defined patent standard, and the consequent containment of the scope of protection, seen recently in the United States. As noted in Chapter VI (above), the pronouncement of the Court of Appeals for the Federal Circuit (CAFC) in the *Festo* litigation is clear

[12] Accepted in the UK, that is.

[13] Takenaka, *Interpreting Claims*, *op cit.* at 26. A similar discussion can be found in Winkler, *The Scope of Patent Protection: Past, Present and Future*, (1979) 10 IIC 296.

illustration of a more restrictive attitude being adopted by this erstwhile manifestly pro-patentee court.[15] However, whilst the position envisaged by the Protocol on the Interpretation of Article 69 EPC, that a middle ground should be trodden between using the claims merely as a guideline and interpreting them literally, appears to be producing a more harmonised approach, certain tensions are still perceived to exist. In order that this perception of tension can be clearly understood,[16] it is necessary to establish a picture of the doctrinal and historical pressures that fuel the view of this Anglo-Germanic interpretative conflict. Therefore, we turn our attention to the establishment and growth of patent protection in Germany, and explore some of the theories that underpin its existence.

Towards Protection

As noted in Chapter III above, the lack of a patent system in the Germany Zollverein[17] provided one of the main bones of contention for the critics of the British system in the 'Anti-Patent' debate of the mid-19th century. It will be recalled that both sides in the argument utilised the absence of protection as illustration that their own view was correct. The abolitionists called for an end to the idiocy that enabled the free movement of inventive information on the Continent whilst in Britain growth and technological freedom was hampered by 'pernicious patents'. The pro-patent lobby, on the other hand, cited famous examples of German 'defectors' who moved to the UK ostensibly because of the protection that their inventions would receive there.

By the end of the century, however, resistance to patents had crumbled and British system was saved from abolition. The changing face of invention and innovation, particularly the rise of large research intensive firms, had emphasised the need for some degree of incentive/reward to enable the recovery of costs sunk in the name of R&D. Therefore, rather than abolishing a system that was accepted in principle, but unpopular

---

[14] Although not to be confused with European Union harmonisation measures, as the EPC is not a product of the European Union, its precursors or affiliated bodies.

[15] It is submitted that this prognosis remains true despite the US Supreme Court's interference in the case.

[16] The author leaves open for the present the issue of whether this perception is, in fact, a reality.

[17] i.e. the German Customs Union. It will be recalled that various member states of the German Reich had already adopted patent protection, however, these were the exception rather than the rule. See further, Machlup & Penrose, *The Patent Controversy in the Nineteenth Century*, *(1950) 10 Journal of Economic History 1* at 3-6.

in practice, the Government ceded to reform. In Germany the same pressures, especially the growth of large chemical and dyestuff companies like Bayer, Hoechst and BASF, and the political harmony that flowed from the creation of the Second Reich in 1871, meant that those opposing the introduction of a patent system suffered the same fate as their British counterparts. Therefore, in 1877 a uniform patent law for the entire Reich was adopted by the German legislature.

The First Period

Perhaps taking their lead from the established systems of the time, i.e. predominantly the British and American, the claim occupied a fundamental position in the determination of the scope of protection offered by the grant in the First Period. "The question of how far legal protection should extend was decided, in case of doubt, on the basis of the expressed intent of both parties"[18], i.e. the Patent Office and the applicant. The claims were considered concrete declarations of this intent to be construed under private law.[19] Thus, the prosecution history, the discourse between the Patent Office and the patentee, was of vital importance in the determination of the scope of protection at this time.

However, it soon became obvious that the agreed declaration of what the patentee thought they had invented and their actual contribution to the art were often not coincidental. Therefore, in order to provide proper reward to the patentee, i.e. to protect the 'true' invention, the courts initially resorted to "the fiction of a presumptive intent"[20] on behalf of the parties when determining patent scope.[21]

The creation of this fiction of intent represents a significant shift in the underlying theory of patent protection in the German republic. By moving towards a formulation whereby the expressed intention of the parties could be manipulated in this way, the courts began to divorce the determination of scope from the actual language of the claims. Therefore, as Takenaka notes, "the significance of claim language... and that of

---

[18] Winkler, *op cit.* at 297.

[19] This can be seen in decisions such as that of the *Reichsgericht* (the German Supreme Court of the time) of 15th December, 1890. Cited in Takenaka, *Interpreting Claims*, *op cit.* at 28.

[20] Winkler, *op cit.* at 297.

[21] Illustrated by the judgment of the *Reichsgericht* of 4th May, 1889. Cited in Takenaka, *Interpreting Claims*, *op cit.* at 28, and Winkler, *op cit.* at 297.

disclosure... were reversed."[22] Whereas previously the claims had defined the scope of protection, functioning as evidence of an agreement between the Patent Office and the patentee, the courts now took the view that this agreement *must* have been intended to cover all possible embodiments disclosed by the patent unless there was clear evidence to the contrary.[23] Where the prosecution history clearly dictated that a wide view could not be taken this enabled the courts to limit the scope to a point corresponding to a literal (or even sub-literal) interpretation of the claims. However, clear adoption of the reward theory of patent protection meant that the predominant trend was towards an expansion from literal interpretation.[24]

This development of protection theory along reward justification lines was aided by the fact that the German model adopted a strict separation of jurisdiction between the Patent Office and the courts. The technical scope of the invention was defined by the Patent Office, which had exclusive jurisdiction over the grant and validity of the patent and which required the claims to be drafted in a prescribed form.[25] The courts, on the other hand, determined the ambit of protection, which now moved towards recognition of the essence of the invention and its contribution to the state of the art. Therefore, the scope of a patent was extended to cover all of the embodiments of which the patentee could possibly have conceived, including sub-combinations of claimed elements where the sub-combination itself did not lie in the state of the art.[26]

---

[22] Takenaka, *Interpreting Claims*, *op cit.* at 28.

[23] i.e. evidence from the prosecution history limiting the scope.

[24] It should be noted that the Japanese courts also adopted a similar approach to determining patent scope, unhampered by the wording of the claims, however, whereas in German practice the courts expanded protection, in Japan the converse was true. The courts utilised the description to limit the scope of the patent to the disclosed embodiments rather than expanding it to cover the inventive contribution to the art. See further the discussion in Chapter VIII, below.

[25] See further, text accompanying note 47 (below). c.f. the liberal approach of the British Patent Office at this time regarding the form and content of the claims.

[26] See Takenaka, *Interpreting Claims*, *op cit.* at 29. This mindset can be seen to be influenced by theories relating to Interessenjurisprudenz, whereby it was argued that the interpretation of documents should be carried out with the interests of the parties in mind, here the patentee. See further, Bredimas, *Methods of Interpretation and Community Law* (1978; Elsevier North-Holland, New York).

The Second Period

In 1910, this move towards detachment of the scope of protection from the wording of the claims was made complete by a judgment of the *Reichsgericht*[27] in which it concluded that the intentions of the Patent Office and the patentee should be disregarded completely when determining the scope of the patent.[28] Rather, the extent of protection should be determined exclusively by its contribution, objectively judged, to the state of the art. By adopting this approach to the assessment of patent scope, the Court answered the emerging problem of adequately rewarding the patentee for their inventive efforts. Therefore, whereas the American courts had adopted peripheral definition theory and the doctrine of equivalents to protect the inventor's interests, the German courts moved fully to central definition theory.

This divorce of patent scope from the claims heralded the beginning of the Second, most expansive/least certain,[29] period in German case law. In order to justify the courts' growing tendency to divert from clear and unambiguous wording of the claims from the end of the First Period, German legal philosophers had put forward hypotheses based on the separation of jurisdiction between the courts and the Patent Office. One of the leading theorists was Isay,[30] who stated that, as the Patent Office defines the subject matter and decides on the patentability of the invention, and the courts independently decide on the scope of protection, the former's interpretation of the state of the art in the context of examining the invention during prosecution is irrelevant once that grant is made. Indeed, given that the Patent Office only considers the invention as a whole, and never any modification or sub-combination of its elements, and given the impossibility of being able to consider all of the prior art before grant, the role of the Office must be limited to consideration of patentability only. Therefore, given the separation of jurisdiction, and given the different purposes of the investigations by the two bodies, the intention of the Patent Office in making the grant

---

[27] Judgment of the *Reichsgericht* of 9th/10th February 1910 (Takenaka cites the 9th, whereas Winkler cites the 10th). *80 Reichgerichtsentscheidunger in Zivilsachen (RGZ) 54*.

[28] See Winkler, *op cit.* at 297.

[29] And therefore most/least favourable period depending on which side of the fence (patentee or competitor) you happened to be sitting.

[30] Put forward in Isay, *Wesen und Auslegung des Patentanspruchs, [1909] Mitteilungen der Deutchschen Patentanwälte 138*. Cited in Häusser, *Claim Wording, Inventiveness and Scope of Protection Under German Patent Law*, in Kemp, *op cit.* at 89 (hereinafter Häusser).

and the interpretation that it places on the state of the art could not be binding on the court's determination of the scope of protection.[31] This approach has the benefit of avoiding the need to simultaneously view the prior art retrospectively in order to determine the subject of the invention and prospectively to determine future solutions of an identical or similar type when determining the scope of protection of the patent. It therefore left the Patent Office free to concentrate on the simpler task – a task that Häusser notes is "from its very preconditions, appropriate to the Patent Office – of assessing the subject of an invention by a retrospective comparison with the prior art at the date of filing."[32] It was this theory that the German Supreme Court adopted in its 1910 decision.[33]

The wholesale adoption of a reward based justification for the patent grant established another key principle in German 'claim interpretation' at this point, namely the idea that a broader scope of protection should be given to so-called 'pioneer inventions' than should granted to minor advances.[34] Therefore, the scope of protection provided by the patent, although not encumbered by the wording used in the claims, was still limited in certain ways by the prior art. If the patent did not add to the prior teaching in any appreciable manner then it was not deserving of reward and would receive a narrow interpretation, if it was pioneer on the other hand then the converse would be true. Heavy reliance on the state of the art as a limiting factor on the protection granted by a patent rendered this conclusion apposite, as pioneer inventions, by their very nature, are unencumbered by prior teaching.[35]

---

[31] This generalisation of Isay's argument is paraphrased from Takenaka, *Interpreting Claims op cit.* at 30, and Häusser, *ibid.* at 89-90.

[32] Häusser, *ibid.* As might be imagined from this quote, Häusser is very defensive of the virtues of this particular approach. He continues, stating that "A satisfactorily wide scope of protection necessarily demands correspondingly high standards of inventiveness as a precondition of patentability... This effect on the requirements qua inventiveness must essentially be regarded as advantageous." *Ibid.* at 90.

[33] See note 27, above.

[34] See the decision of the *Reichsgericht* of 2nd March, 1912. Cited in Takenaka, *Interpreting Claims, op cit.* at 31.

[35] The reader will note the relative difficulty that commentators have had explaining a similar expansive approach to pioneer inventions in the United States where protection is based on peripheral definition and the reward theory gains little support. See further in Chapter V, above.

Such expansive, indeed potentially limitless, deviation from the wording of the claims attracted widespread criticism, most notably on grounds of the uncertainty that it injected into the process of innovation and patenting. Whilst theoretically beneficial to the patentee, providing protection commensurate to the inventive merit of their creation, third parties were at disproportionate disadvantage. This was because one could no longer rely on the patent documentation to determine the scope of the invention. The patent revealed the invention, but the scope was determined by looking at this disclosure through the veil of prior art that surrounded it. In other words, by promoting the reward theory above all other classical justifications of the patent grant, the German practice in the Second Period had undermined the value of the patent as an information tool.[36] This defect in the system also provided disadvantage to the patentee, as they could not be certain of the scope of their grant, which had important repercussions for the decision to litigate.

The Third Period

Disquiet amongst practitioners and industry alike concerning the uncertainty of the patent grant eventually galvanised the Supreme Court into action to temper the now runaway expansive doctrine of the Second Period. The high water mark[37] had come in a decision of the *Reichsgericht* in which the Court held that "a patent protects all techniques taught by the patent specification to those skilled in the art, irrespective of the wording of the claim."[38] Subsequent cases marked a retreat from this position, a retreat that was completed by a ruling of the Federal Supreme Court[39] of 11th May 1954.

---

[36] For more information on the information function of patents see text accompanying note 124 *et seq.* in Chapter III, above; see also Beier & Straus, *The Patent System and its Information Function – Yesterday and Today*, *(1977) 8 IIC 387*.

[37] According to Bruchhausen, *The Scope of Patent Protection in Different European Countries – An Outline of Recent Case Law*, *(1973) 4 IIC 306* at 322. Takenaka is uncharacteristically vague in her discussion of the retreat from the expansive interpretations of the Second Period. She states that opposition to such broad interpretation had mounted by the late 1930s and marks the Third Period from 1940 onwards, but offers a Supreme Court decision of 23rd October 1952 as authority for the adoption of the 'three-part' doctrine. See Takenaka, *Interpreting Claims*, *op cit.* at 33. Ostensibly taking Winkler's vague assertion that attempts had been made to temper the "legal uncertainty" caused by broad interpretation since "about the end of the 1930s" as gospel. See Winkler, *op cit.* at 297. Bruchhausen's account is therefore preferred.

[38] Decision of 10th November, 1942. Quoted from Bruchhausen, *ibid.*

[39] The *Reichsgericht* has ceased to be with the collapse of the Third Reich.

Previous decisions had established the existence of a three-part doctrine for the determination of the scope of protection of a German patent. Under this new theory, the claims once more became the basis for determining the scope of the grant. The 'three part' doctrine was so-called because it stated that there were three areas of protection that could be distinguished when determining patent scope. The first corresponded to the literal scope of the claims, or the "direct subject of the invention."[40] The second encompassed evident equivalents, i.e. those equivalents immediately evident to the person skilled in the art on the basis of her expert knowledge at the priority date; and the third covered non-evident equivalents, also known as the "general inventive idea". The Supreme Court's decision of 11th May 1954 completed the basic test by stating that the general inventive idea must be deducible from the patent claim. Thus the claim became the central basis for patent protection once more.[41]

Whilst it is clear that the scope accorded to patents in the Third Period was considerably narrower that that of the Second, the German system was still criticised as providing uncertain protection.[42] Indeed, concerns over the breadth of the general inventive idea contributed to the decision to insert the Protocol on the Interpretation of Article 69 into the EPC.[43] Therefore, in order to aid fuller understanding of the 'middle road' along which this provision is intended to steer we now turn our attention to consider the 'three-part' doctrine in more detail.

The 'Three-Part' Doctrine

As already noted, the 'three-part' doctrine was adopted in order to reduce the uncertainty that surrounded the determination of patent scope at the end of the Second Period of claim interpretation. In essence, it stated that there were three zones of

---

[40] See, for example, Sijp, *The Scope of Protection Afforded by a European Patent*, (1979) 10 IIC 433 at 436; also Takenaka, *Interpreting Claims*, *op cit.* at 33.

[41] This is not to say that the literal claim language binds the courts, merely that the claims must be used as the starting point in the determination of the scope of protection.

[42] See, for example Sijp's comments that "It does not, however, seem desirable that the scope of protection should be determined for all patents by abstract guidelines...". Sijp, *op cit.* at 448. Also Bruchhausen, *The Scope of Patent Protection in Different European Countries – An Outline of Recent Case Law*, (1973) 4 IIC 306, at 325, noting that such a split examination system may additionally be open to abuse.

[43] See Armitage, *Origins of Relevant Provisions of the Munich and Luxembourg Conventions*, in Kemp, *op cit.* at 10.

protection provided by the patent. The first, core category, was that of the direct subject matter of the invention, or the literal scope of the claims.

The "Direct Subject Matter of the Invention"

This was the kernel of the patent, the element that existed in deference to the fact that the Patent Office had seen fit to make the grant, and which survived even if the subject matter of the invention was anticipated by the prior art.[44] It was considered to be the minimum degree of protection available to the patentee, to be meted out only in cases where the invention was in fact nil. The purpose of this construction was intended to "spare competitors, if possible, the necessity of bringing a nullity suit."[45]

The prospect of resorting to a literal interpretation of the claims only in cases where the patent is in fact objectively invalid seems very strange when looked at from the British point of view. However, the reasons for the differences in practice are two-fold. First, the reader will appreciate that in the UK the courts have jurisdiction over both infringement and validity proceedings, and are therefore able to strike down claims, or even remove entire patents from the register, where they are anticipated by the prior art. The strict jurisdictional separation evident in Germany makes this process impossible for, as previously noted, ordinary German courts deal exclusively with matters of infringement and the Patent Office has exclusive jurisdiction to determine validity. Therefore, it was only after a successful application for revocation that the literal wording of the claims ceased to be a problem for the alleged infringer.[46] Second, in addition to these differences in practice, there was also disparity in claim style itself during this pre-harmonisation period, which renders direct comparison impossible. Whereas in Britain the principle for many years had been that the patentee was free to draft their claim in any manner that they chose, in Germany the Patent Office had rapidly adopted a prescribed pattern of claim shortly after the inception of protection.[47] Häusser gives succinct summary of the practice thus: "...the generic category to which

---

[44] See, for example, *Schienenschalter II [1972] GRUR 597*. Cited in Sijp, *op cit.* at 436.

[45] Winkler, *op cit.* at 298.

[46] See Sijp, *op cit.* at 436.

[47] See Vojáček, *A Survey of the Principal National Patent Systems*, (1936; Prentice Hall, New York) at 149 50, who states that "Germany was the first to evolve in the eighties of the last century a special type of claims, neatly divided into a preamble indicating the object of the invention and the known features thereof, and the characteristic definition of the new features for which protection is claimed."

the invention was most closely subordinate was first stated, followed by the essential features of the invention; this was done by separating the two parts by the words 'in which' or 'characterised in that'." He continues, stating that "the need to differentiate the novel features of an invention from previously known features led to a corresponding grouping of features. Accordingly all previously known features were to be found before the phrase 'characterised in that', in the so-called generic clause or pre-characterising clause, whilst the novel features were put into the characterising clause. This, even at a very early stage, led to the adoption of a wording of the claims which subsequently was prescribed as essential, and is in use to this day."[48]

Therefore, given the strict requirements of the Patent Office relating to the formulation of the claims, and the fact that the courts habitually determined the scope of protection based on equivalents analysis, a literal interpretation of the claims of a German patent was correspondingly narrower than its British counterpart.[49]

The "Subject Matter of the Invention"

The subject matter, or technical teaching, of the patent formed the second level of protection around the invention. As already noted, in the central definition theory of claim interpretation the claims form the core of the monopoly, but protection is determined by extrapolation from this central point based on what the patent actually teaches the skilled addressee.[50] Therefore protection extended to cover any substitution by elements that were clearly equivalent to those in the patented invention, providing they had the same technical function and retained the same effect regarding the inventive idea.

The subject matter of the invention was found by adopting a problem-solution analysis; examining the problem that the patented invention set out to solve and the solution that it provides. Such an examination was designed to expose the technical teaching, which lay in a combination of elements. Given that the entire specification would be utilised for the purpose of defining the elements of which the invention consisted, it was

---

[48] Häusser, *op cit.* at 88. This day referred to was the date of the Benescience Foundation Conference on Claim Drafting and Interpretation held in May 1981.

[49] See further Vossius, *Claims Drafting and the Supporting Description under the EPC and the German Patent Law*, in Kemp, *op cit.* at 68-72. Also Armitage, *Interpretation of European Patents*, *op cit.* at 813-4.

[50] See further the text accompanying note 19 in Chapter VI, above.

immaterial whether the individual components were separately claimed (or even whether they were mentioned in the claims at all). The important factor was that the skilled person would have understood the invention to compose of these elements at the priority date, without knowledge of the alleged infringement. As Sijp notes, it was only in a borderline case that "the technical teaching may coincide with the literal wording of the claims,"[51] in most other cases this level of generalisation of the invention supplemented the literal scope.

Once the subject matter of the invention had been determined, the alleged infringement then underwent a similar elemental analysis. The two were then compared, and the obviousness of any substitutions, omissions or additions to the patent formula were considered. It is important to note that the German practice under this head of protection did not require one-to-one substitutability of elements, therefore infringement could not be avoided if an element was omitted provided that its omission did not change the manner in which the accused embodiment solved the technical problem. Therefore, the technical teaching of the invention can be seen as similar to the essential elements of the invention under an equivalents analysis. As long as the alleged infringement had the same function and operated in the same way to produce the same result then a finding of infringement would be forthcoming.[52] However, it is clear that whereas the 'function, way, result' formulation utilised in American decisions such as *Graver Tank*[53] required the elements to be identified in the claims themselves, the German tradition of the Third Period made no such demands. The focus here was on what the specification taught the skilled addressee, and only modifications, variants, substitutions, additions or omissions that were immediately evident to the average person skilled in the art were included within the scope of protection. Therefore, this level of abstraction from the specification of the patent was relatively uncontentious as the requirement that any variation be immediately apparent arguably placed no undue burden on the patentee's competitors as it closely paralleled the practice that the Patent Office would undertake when considering patentability. Additionally, as already noted, expansion of the scope of protection beyond the literal wording of the claims was only

---

[51] Sijp, *op cit.* at 436.

[52] See *Molliped, [1974] GRUR 460* for an example of the application of this test. Cited in Sijp, *op cit.* at 436.

[53] *Graver Tank & Mfg Co. v Linde Air Products Co., (1949) 339 U.S. 605.*

available where the technical teaching was itself novel. If it was not then protection was limited to the direct subject matter of the invention.

The "General Inventive Idea"

Finally, extending out from the previous zones of influence lay what was known as the 'general inventive idea'. Justification for this layer of protection derived from the premise that the inventor should be able to reap reward to the extent that their invention enriched the art.[54] The patentee's monopoly therefore extended, subject to certain criteria, to cover equivalents that were not immediately evident from the claims but which were nevertheless deducible by the average person skilled in the art. This level of generalisation came to characterise the German practice, and formed the subject of most criticism directed towards the system. The main problem lay in the association that this layer had with highly expansive, far-reaching and uncertain protection; all characteristic features of the much maligned Second Period.

In order to dispel some of the concerns surrounding the adoption of this third leg of the three-stage test, Chief Justice Lindenmaier of the German Supreme Court set out to provide firm theoretical justification for extending protection in this way.[55] And in doing so gave credence, if it was needed, to Vojáček's assertion that "With typical German thoroughness the basic conceptions of patent law are dissected and followed up almost to a transcendental plane."[56] Lindenmaier's explanation of the need for protection outside of the subject matter of the invention focussed mainly on the separation of jurisdiction between the courts and the Patent Office, and in many ways resembled similar justifications put forward in an attempt to legitimise the practice of the Second Period. However, he also gave his name to a list of three criteria[57] that must be satisfied before infringement can be found under the 'general inventive idea', and in doing so helped to quell some of the fears concerning the potential uncertainty that the concept engendered.

---

[54] See Sijp, *op cit.* at 437, citing Spengler, *[1967] GRUR 390*.

[55] Lindenmaier, *Der Schutzumfang des Patents nach der Neureren Rechtsprechung, [1944] GRUR 49*. Cited in Takenaka, *Interpreting Claims*, *op cit.* at 34.

[56] Vojáček, *op cit.* at 149.

[57] Sometimes referred to as "Lindenmaier's provisos". See Sijp, *op cit.* at 437. Also Beton & Heimbach, *Claim Drafting and Significance – An Anglo-German Industrial View*, in Kemp, *op cit.* at 44.

Sijp summarises these criteria as follows:

> "1). The general inventive idea must be deducible by the average person skilled in the art from the claims of the alleged infringement, using the knowledge available on the filing or priority date.
>
> 2). Deduction of the general inventive idea must not entail any inventive effort.
>
> 3). The general inventive idea must satisfy all requirements for patentability; it will be for the Court to examine, in an infringement case, whether it in fact does so."[58]

Therefore, the difference between this category of protection and that available under the subject matter of the invention lay in the degree of consideration that the skilled addressee must devote to the subject of equivalence. Under the technical teaching any equivalents had to be immediately evident, if they were then the assessment stopped there and liability (subject to any defences) was established. If, on the other hand, the alleged infringement fell outside of the subject matter of the invention, the court would then consider the general inventive idea. This involved an examination of whether, after *special and detailed consideration*, the average person skilled in the art would have realised, at the priority date and without exercising inventive effort, that they could have replaced elements of the patentee's invention with elements of the alleged infringement and still have solved the technical problem in the same way. Thus the difference between the second and third stages of the three-part theory lay in the degree of consideration that must be directed towards assessing the substitutability of the elements. By limiting the application of the general inventive idea to cases where this substitution did not require the exercise of inventive effort, the courts could be seen to be putting important restrictions on the scope of the doctrine whilst simultaneously promoting innovative practice by safeguarding the rights of competitors to *invent* around the patent.

The Defence of "State of the Art"

In addition to being able to restrict protection to the literal scope of the claims where the patent was clearly anticipated, and limiting the application of the general inventive idea to non-inventive equivalents, certain other safeguards grew up alongside the three-part test that served to mitigate the harsh results that the separation of jurisdiction may have caused. One of the most powerful of these was the defence of the state of the art. Here, despite the fact that the courts did not have the power to examine the validity of a

---

[58] Sijp, *op cit.* at 437.

patent in infringement proceedings, it was possible to circumscribe liability by consideration of the patentability of the accused embodiment. If it clearly lay within prior teaching then the court could legitimately avoid enforcing the patent without trespassing on the exclusive territory of the Patent Office.[59]

The Object of Criticism

However, despite the safeguards that the defence 'state of the art' and resorting to literal interpretation of the claims when the patent was clearly anticipated may have placed on an expansive interpretation of the scope of protection, significant problems concerning the perceived uncertainty of the grant remained. Difficulties inherent in the three-part doctrine, such as the problem of distinguishing between evident and non-evident equivalents, attracted widespread criticism.[60] Even the courts considered that the distinction should be abandoned and that the latter category should be included in the subject matter of the invention.[61]

Moreover, as Winkler notes, adopting an objective standard for assessment of the general inventive idea does not actually provide any real degree of certainty. Such a standard is, after all, tainted with both the possibility of hindsight and the impossibility of saying with any degree of precision "how the average person skilled in the art, a purely fictitious person, would have acted..."[62] It is accepted that this is also a problem implicit in the determination of inventive step, however, whereas uncertainty regarding the grant of a patent is undoubtedly important for the prospective patentee, it has far less practical impact on the field in question than uncertainty relating to the scope of that patent once granted. In addition to this, the problems connected with predicting the outcome of an infringement action were increased in the case of pioneer inventions by the court's extension of the scope of protection to cover embodiments utilising the

---

[59] The reader will note the similarity of this test to the *Gillette* 'defence' in the U.K. where the defendant argues that their alleged infringement is not novel in the light of the prior art, thus placing the claimant on the "horns of a dilemma". See *Gillette Safety Razor Co. v Anglo American Trading Co. Ltd.*, *(1913) 30 RPC 465*. For further information on the Infringement/Validity mirror see Wepner, *The Patent Invalidity/Infringement Parallel: Symmetry or Semantics? (1988) 93 Dickinson Law Review 67*.

[60] See, for example, Winkler, *op cit.* Also Sijp, *op cit.*

[61] See judgment of the *Bundesgerichtshof*, 15th March, 1960, *[1960] GRUR 474*. Cited in Takenaka, *Interpreting Claims*, *op cit.* at 36.

[62] Winkler, *op cit.* at 304.

underlying ideas, regardless of whether the person skilled in the art would have conceived of them.[63]

The inconvenience caused by the 'fair' and yet uncertain grant was alleged to be considerable and prompted many commentators to call for narrower protection. Sijp, for example, concludes after much consideration that "A narrow interpretation is ... preferable by reason of its social consequences,"[64] among them the lower chance of lost investment through unwitting infringement. This sentiment was carried through under the new law (discussed more fully below) and resulted in the jettison of the general inventive idea with the 1986 decision of the German Supreme Court in *Re Formstein.*

However, during the Third Period these problems associated with assessment of the general inventive idea were effectively absorbed within the system as a whole, and were seen by many as a small price to pay for adequate protection of the patentee's interests. Häusser, for example, expressed considerable fears over the move away from the three-part doctrine towards the harmonised standard called for by the EPC. He stated that a perceived narrowing of scope might cause claims to be broadly drafted in order to set down every conceivable embodiment to preserve the widest possible protection. This, he claimed, would lead to uncertainty.[65]

Häusser's comments obviously reveal a fear of the unknown, but in addition to this they also expose a fundamental issue in our discussion. Comparison with external systems, in this case the revision imposed by the EPC, often leads to acontextual reactions concerning perceived limitations and benefits without consideration of the broader picture. This balancing of factors ignores the fundamental observation that the process of change in itself engenders uncertainty; uncertainty that is only dispelled when a point in time is reached at which 'new' becomes 'normal'. Therefore, rather than drawing incomplete comparisons with external systems in the quest for something 'better', the focus should first be directed inwards. Thus, by externalising the standard by which

---

[63] See, for example, Supreme Court Judgment of 15th April 1975, *[1975] GRUR 484*, cited in Takenaka, *Interpreting Claims*, *op cit.* at 35.

[64] Sijp, *op cit.* at 449.

[65] See Häusser, *op cit.* at 96-102

protection was assessed, and by providing strict control of the intrinsic scope[66] of the patent, the German system in the Third Period undertook the monumental task of reigning in the runaway doctrine of the Second, and therefore provided certainty relative to it. The factor of change is fundamental to this assessment, as the system cannot be isolated from the administrative and social context in which it exists. Moreover, concepts of fairness and certainty, upon which any comparison is based, only gain meaning once their definition has been fixed by revelation of what is *un*fair and *un*certain. Therefore a comparison between Second and Third Periods is more apposite as the scope of protection is the only variable, everything else (the patentee, the grant and the drafting style of the patent) remained constant.[67] The same cannot be said of a raw, unqualified, comparison with the British approach to claim interpretation, especially if one takes the view (as is almost invariably the case) that one or other offers a 'better', or even 'correct', level of protection. In other words, such a comparison is rendered devoid of meaning unless appreciation of the wider administrative and social context of the grant is undertaken, including the expectations of the patentee and the public. For a British patentee faced with a Third Period interpretation of a British grant the protection provided would have been relatively uncertain compared to that they could expect at home, however, when viewed from the position of a Second Period patentee the converse is true. However, this assessment fails to take into account the fact that the British patent would not have been drafted in the British way at the hands of a German patent attorney for protection in Germany. Therefore any comparison at this level, other than for the purpose of illustrating that alternative approaches are available, is meaningless and simply serves to divert attention from the real question of whether protection is too uncertain to achieve the purposes of providing that protection in the first place – i.e. whether the system works.

At the core of any patent system, separate from the various theories that can be utilised to justify the grant, lies a common purpose – what the drafters of the American Constitution succinctly defined as promoting of the progress of science and the useful

---

[66] Defined, as in Chapter IV, as the scope with which the patent is drafted.

[67] Of course, the German political and cultural context was in a period of flux at this point in time, however, whilst this may provide clues as to the motivation of the courts in making the change from the Second to Third Periods, it does nothing affect the validity of the comparison, *per se*.

arts.[68] The key element is the assumption that technological progress is beneficial, and regardless of whether it is justified on the basis of natural right, reward, prospect, incentive, race, or whatever, that the patent system has links with this concept. This purpose is not achieved by any one element but by the system as a whole, by the complex interrelation of components, and it is perceived failure in this core that prompts internal change. Thus, the body of opinion turned against the system of the Second Period and gave rise to the Third. The German system in the Third Period worked. It was criticised, it was exalted, supported and denounced, but one key fact is undeniable; German industry did not falter and grind to a halt under its influence, the inventive landscape was not choked with unwieldy broad grants. It served its purpose. Indeed, such was the support for this method of interpretation that no agreement could be found over narrowing the wording of the Official German version of Article 69 EPC (which refers to the 'contents'[69] of the claims) to match the Official English and French versions (referring to 'terms').[70] Change, when it came, was externally imposed and highlights another key point.

It is only when a national patent system becomes international that a divergence in claim style and interpretation becomes important, and then primarily to foreign patentees used to one form of drafting. To assume that all other countries will interpret claims in a manner akin to that of the home courts is both arrogant and unfair, yet is the predominant principle that underlies any harmonisation measure. Implicit also is the assumption that the harmonised product is superior to the original. Whilst this may be the case as regards the ease of transfer between nations, it is not necessarily so across the board.[71] Indeed, as demonstrated by the growth of the British system, it is apparent that different standards may be appropriate at different moments in a country's

---

[68] Article 1, §8, cl.8.

[69] Inhalt.

[70] See further, Armitage, *Interpretation of European Patents*, *op cit.* at 813-4, discussing the history of Article 69 EPC and the Protocol on the Interpretation thereof.

[71] Insight into the Japanese system, discussed in Chapter VIII below, provides graphic illustration of this point.

technological evolution due to the variation in incentives that broad or narrow protection provides to the inventive pool.[72]

Concerns over traditions of divergent interpretation in Europe led to the adoption of the Protocol on the Interpretation of Article 69 EPC once the decision to harmonise had been made. Whatever the subsequent successes or failures of this measure, it is noteworthy in that it achieved a diplomatic compromise that secured speedy enactment of the EPC.[73] It is therefore to this post-Protocol period of interpretation that we now turn in order to see how the institutional and operational traditions of the past have been adapted to meet these new requirements. In doing so we shall see a characteristic evolutionary lag in caselaw reflections of the new regime as the system slowly reacts to the imposed standards of interpretation.

The Fourth Period

The German Patent Act of 1981 was promulgated in order to satisfy Germany's obligations under the EPC. It included a provision (section 14) corresponding to Article 69 and the Protocol on its interpretation.[74] It will be recalled that the latter expressly rejects the expansive protection created by the central definition theory where the claims serve simply as guidelines in the determination of the scope of protection. Therefore German practice had to be modified to a position whereby the claims occupied a position more central to the grant.[75]

It is widely accepted that the position adopted by the courts in the Third Period was "never as woolly as assumed by the Protocol"[76]. However, the presumption underlying the protection of the general inventive idea – that the patentee is entitled to reward to

---

[72] For example, it is often said that broad protection encourages so-called 'pioneer' invention whereas narrow protection encourages more in the way of 'follow on' innovation. See further the discussion of the economics of the patent system in Chapter V, above.

[73] Sherman, *Patent Claim Interpretation: The Impact of the Protocol on Interpretation, (1991) 54 MLR 499* at 509 notes this as one of the Protocol's main, and often overlooked, successes.

[74] Section 14 of the 1981 Act therefore provides that "The extent of protection conferred by a patent or patent application shall be determined by the contents of the claims. Nevertheless, the description and drawings shall be used to interpret the claims."

[75] This is not to say adopting a position of central definition, merely that the claims could not be passed over in consideration of the scope of protection.

the full extent of their contribution to the art – is most significant and can be seen to have coloured many decisions under the 1981 Act. Most important here is the *Epilady* litigation,[77] noted above, in which parallel actions[78] were commenced in several jurisdictions including Germany and the UK with wildly differing outcomes, and where no common reasoning on the issue of claim interpretation could be found. However, before examining the position taken by the German courts in this case, time must be taken to explore a decision of the *Bundesgerichtshof* that represented the leading authority at the time, and has even been utilised by the English Court of Appeal as providing a test preferable to the established *Catnic* approach to claim interpretation:[79] *Formstein (Moulded Curbstone).*[80]

Formstein

Any change in the legal standards concerning the interpretation of patent documentation necessarily takes time to filter through the system.[81] Confusion over the scope of the 'new' grant was therefore considerable in the early 1980s as patentees, practitioners and the lower courts considered the impact of the revisions.[82] Relief came in the *Re Formstein* decision.

The patent in question claimed the following:

---

[76] Jacob, *Claims and Infringement*, *op cit.* at 67.

[77] In the UK principally *Improver v Remington [1990] FSR 181*. For the German decision see *Improver v Remington (1993) 24 IIC 838*.

[78] Dealing with national, but for practical purposes identical, patents.

[79] In *PLG Research v Ardon International [1995] RPC 287*. Although it must be noted that this rally in *Formstein*'s favour was very short-lived; Aldous J refused to follow the 'new' approach in *Assidoman Multipack v The Mead Corporation [1995] RPC 321* less than two weeks after the decision in *PLG*.

[80] Reported at *(1987) 18 IIC 795* with comments by Geissler. Also *[1991] RPC 597*. All quotes are taken from Geissler's translation in IIC.

[81] An application for a patent takes an average of 44 months to progress to grant under the EPC. See http://www.european patent office.org/epo/obtain.htm. Additionally, Section 14 of the new German law only applied to patent applications made after the 1st January 1978 – see Häusser, *op cit.* at 94-5. Therefore, it is to be expected that there would be a lag of at least 44 months post-1978 for cases to enter the courts. Appeal adds more time to this equation, so interpretations of the provisions of the new law in the Higher Courts would be expected some seven or eight years after the first applications – i.e. approximately 1985.

[82] See, for example, the discussions in Kemp, *op cit.*

> "1. Integral or cross-sectionally multi-part moulded stone with a longitudinal trough for dewatering lines at the side of the road, characterised by the fact that it comprises at least one cross channel branching off form the longitudinal trough and opening into the side of the stone facing away from the street centre.
>
> 2. Moulded stone in accordance with claim 1, characterised by the fact that the cross channel has a small inclination."

In other words, a sloping curbstone with channels to guide water and debris away from the street, thus facilitating drainage.

The defendant was a city that had laid a street with conventional paving stones setting gravel-filled gaps between them to channel the water. The patentee brought an action for infringement. At first instance the court found the patent infringed, issued an injunction and awarded damages. On appeal the decision was reversed. The Supreme Court was therefore provided with a perfect opportunity to review the revisions to the patent law and to comment on their interpretation. In an uncompromising decision, it did just this.

The Court explained that the effect of Article 69 EPC and the Protocol on its Interpretation was that "[i]n contrast to the legal situation until 1978, patent claims are now not merely the starting point but rather the *essential basis* for the determination of scope."[83] [emphasis supplied]. In making this statement, the Court clearly anchored the claims at the core of the grant, however, such was the magnitude of change brought about by the revisions, and such was the firmness of the Court's resolve to ensure their proper implementation that it continued:

> "In terms of Sec. 14(2) of the Patent Act of 1981, the contents of the claim have to be determined by interpretation, taking the specifications and drawings into consideration. As the protocol on the interpretation of Art. 69(1) EPC (corresponding to Sec. 14 of the Patent Act of 1981) shows [citation omitted], the interpretation does not only serve the purpose of correcting uncertainties in claims but also of clarifying the technical terms used in the claims as well as the limits and bounds of the invention described therein...
>
> Under the Protocol on the Interpretation of Art. 69 EPC, the scope of a patent encompasses not only what follows from the precise wording of the claims. This opens the way for a determination of the scope of protection beyond the wording of the claims to encompass modifications of the invention circumscribed in the claims...
>
> The scope of protection of a patent filed after January 1, 1978, is determined as regards the use of the invention by equivalents, by the contents of the claims to be determined by interpretation. The significance of the invention as recognized by person skilled in the art has to be considered. The question is whether a person skilled in the art based on the invention protected by the claims, is able to clear up the

[83] Judgment of the Supreme Court section 5(b), first paragraph. See *(1987) 18 IIC 795* at 798.

> problem solved by the invention with equally effective means, i.e. to achieve the desired success with other means which also lead to the same result. Solutions which the average person skilled in the art can determine due to his professional knowledge as being equally effective based on considerations oriented to the inventions *paraphrased* in the claims will generally fall within the scope of protection of the patent. This is required by the goal of adequate remuneration for the inventor under consideration of the aspect of legal certainty." [emphasis supplied]

Abandoning the uncertainty of the 'principle of the invention' as a determinant of the scope of protection, the Court clearly considered that the new law marked a firm departure from the principles of old. However, the way in which the Court structured the new test, and in particular the statement that the invention is "paraphrased in the claims", belies the legacy of expansive interpretation and leads to a perverse, indeed in the light of its previous comments, paradoxical, state of affairs. As Geissler notes, "The Court in this case... while holding that there is a new law, in fact provides a potential scope of protection, which, at least in this case, does not seem to be different from, and is in particular not less than that which was usual in Germany."[84] The test had changed – now the basic question was whether the person skilled in the art was able, on the basis of their specialist knowledge, to arrive at the allegedly infringing embodiment using the specification and the claims – but the scope was startlingly familiar. Thus, a street of the defendant's construction could potentially infringe a claim directed to a moulded stone.

The potential inequity flowing from such an expansive interpretation of the claims seems to have been apparent to the Court, as in addition to its discussion of infringement it also strengthened the defence of the 'state of the art'. Therefore, whereas previously the defendant could have escaped liability where the alleged infringement was 'known' from prior teaching,[85] the Supreme Court now expanded the defence to include occasions where it was obvious in view of the prior art. This, it explained, "does not limit the *justified* reward for the inventor in return for the disclosure of his patentable invention", but rather secures the freedom of others to continue with non-inventive development of the prior art.[86] Therefore, once again, the mantle of the skilled addressee provided the key to assessing the scope of protection.

---

[84] Geissler, *Comment on Formstein, op cit.* at 802.

[85] i.e. had been previously disclosed.

[86] Judgment of the Supreme Court section 6(a), second paragraph. See *(1987) 18 IIC 795* at 800-801

The adoption of this standard in *Formstein* clearly demonstrates the difficulty of breaking with the old traditions of expansive interpretation and coming to terms with a new, externally imposed regime. The intention of the Court to depart from the practices of the Second and Third Periods is clear, and the message given in the judgment to this effect is robust and uncompromising. However, the subtext pervading the case is littered with remnants of past practice; the references to the object of the law being to reward the patentee and the statement that the invention is "paraphrased" in the claims being the most notable examples of this. Moreover, the Supreme Court's comments clearly demonstrate that infringement by equivalence is as much within the scope of the claim as those elements literally covered by the wording. This point is significant as, contrary to the position in the U.S. where the demarcation between literal infringement and infringement by equivalents is tightly policed, the lack of boundary in Germany allowed broad protection to remain as there was no question of recourse to the doctrine being seen as offering supplementary protection. Accordingly, the German approach still embraced central definition theory as the claims functioned as the post from which protection was anchored, but did not "provide a framework for clarifying which features in the accused device are beyond the literal meaning of the claim language."[87]

However, whilst criticism of the scope of protection post-*Formstein* can be made, any comparison to 'preferred' standards of protection must take into account the wider institutional and administrative context of the grant and the practices that grew up around it. Recourse to the standard of the skilled addressee was made more certain by "constant collaboration with experts appointed by the courts in the most widely varying technical fields, for determining the subject matter of the patent in revocation and infringement proceedings".[88] Thus, the system as a whole reacted to the courts own style of interpretation in order to provide sufficient certainty for efficient operation without compromising the aim of rewarding the patentee. Cognisance of this factor helps to explain the seemingly paradoxical effect of the Supreme Court's decision in *Formstein*, for the trauma of creating a continental shift in the established practices of interpretation would have caused more uncertainty than it aimed to prevent. Therefore, rather than actually altering the interpretative *status quo*, the Court can be seen to be

---

[87] Takenaka, *Interpreting Claims, op cit.* at 157.

[88] Bruchhausen, *Determining Patent Subject-matter in Grant, Infringement and Revocation Proceedings, (1989) 20 IIC 341* at 344.

paying lip service to the new regime on interpretation and effecting transfer by other more subtle means; namely expansion of the defence of 'state of the art'.

Post-*Formstein* Solidification of Approach

Decisions following on from that in *Formstein* show a renewed vigour in the Supreme Court's handling of the issue of claim interpretation. Indeed, the sheer number of cases to reach the Court's doors is, in itself, revealing of the seriousness with which the issue was treated. Therefore, in disputes such as *Ion Analysis*,[89] *Heavy-Metal Oxidation Catalysts*[90] and particularly *Handle Cord for Battery*,[91] the Court of Appeal's continued recourse to the content of the description, giving it precedence over the wording of the claims and allowing 'redefinition' of the invention, attracted strong criticism from the senior Court.

Thus, in *Handle Cord for Battery*, in a powerfully worded judgment, the Supreme Court reiterated its opinion that where the "embodiment to be judged deviates from the meaning of the content of the patent claims", infringement may be only be found in specified circumstances. In order for such a decision to be made, the skilled addressee must, on the basis of their technical expertise, be able to identify "the modified means employed in the challenged embodiment as being equally effective in the solution of the *problem underlying the invention.*"[92] It then continued, stating that "[t]he determination of the scope of protection of a patent under the new Act requires that *the meaning* of the content of the patent claims, to be determined by interpretation, constitutes not only a point of departure but *the decisive basis for the determination the scope of protection.* This must be based on the patent claims..."[93] (emphasis in original). The Court of Appeals had erred by judging the question of equivalent use primarily by reference to the description, and had therefore "lost sight of the partial feature of Claim 1, which typifies the invention..."[94]

---

[89] *(1989) 20 IIC 249*. All three of these cases are discussed by Millett L.J. in *PLG Research v Ardon International*, *[1995] RPC 287* at 308.

[90] *[1989] GRUR 205*.

[91] Judgment of the Supreme Court, 3rd October, 1989. Reported at *(1991) 22 IIC 104*.

[92] *Ibid.* at 107

[93] *Ibid.*

[94] *Ibid.* at 107.

This pronouncement is significant, as it is clear evidence of the Supreme Court striking down past practice and reiterating its more 'claim-centric' approach to the determination of the scope of protection. Furthermore, the Court of Appeal's continued reliance upon 'old' principles demonstrates just how difficult the transition from the Third Period was proving to be. However, the Supreme Court's resolve is unambiguous, and the statement in *Handle Cord for Battery* that the requirement of legal certainty is to be given "the same consideration as providing equal reward for the inventor"[95] reinforces this approach. This said, reward was still the fundamental justification for the grant of patent protection at this time, and this simple fact can be seen to have directly contributed to a broader scope of protection than might otherwise have been the case. Such is clear from the oft-quoted *Epilady* litigation.[96]

Epilady

The multi-jurisdictional litigation between Improver and Remington has provided commentators with much 'fodder' in their discussion of claim interpretation.[97] Parallel actions were brought in the courts of various countries, in Europe and beyond. All dealt with substantially identical claims, specifications, and allegedly infringing embodiments but came to wildly differing conclusions on the matter of infringement. The decisions are therefore often used as clear illustrations of divergent approaches to claim interpretation under the EPC. We shall return to consider the validity of this viewpoint in Chapter IX when examining the British litigation, however, for the present it is sufficient to consider the German approach in isolation.

The patent in question concerned a depilatory device (Remington's "Smooth and Silky") that operated by means of a revolving bent helical spring. The windings of the spring, when moved rotationally, opened and closed, trapping hairs that were then plucked out by the motion of the device. The defendant's product did not contain a spring, but

---

[95] *Ibid.* at 108.

[96] The German proceedings are reported at *(1993) 24 IIC 838*.

[97] See, for example, articles by Sherman, *Patent Claim Interpretation: The Impact of the Protocol on Interpretation, (1991) 54 MLR 499*; Pagenberg, *Twenty-Five Years of Patent Law in IIC, (1995) 26 IIC 752*; Norman, *Determining the Scope of the Patentee's Monopoly: Purposive Construction Revisited, [1998] Anglo-American Law Review 221*; and Bannerman & Hamer, *Different Approaches to the "Doctrine of Equivalents" in Germany, UK, US and Japan, [2000] AIPPI Journal 82* to name but a few (and not to mention the various appearances that the decisions make in text books on Intellectual Property Law).

achieved the same result by substitution with a slotted rubber rod. When bent and revolved, the slits in the rod opened and closed in the same manner as the windings of the spring, thereby facilitating hair removal in the same manner as the patented device.

The Decision

The Düsseldorf Court of Appeals (*Oberlandesgericht*) first considered the patent claims and concluded that the accused device could not be said to fall within their literal scope since the disputed embodiment "uncontestedly does not feature a helical spring".[98] It then proceeded to examine whether the 'slotted rubber rod' could be said to be a helical spring in equivalent form. In undertaking this analysis, the Court adopted a clear 'problem-solution' approach. It went to great lengths to consider the function of the limitations in the claim, assessing the relative merits of both the patented article and the contested embodiment, and was clearly concerned with the technical effects of both.

The fact that this initial analysis was conducted outside of the confines of a discussion of literal infringement is significant as it avoided the need to concentrate on a meticulous analysis of the consequences of using the term 'helical spring'. The starting point was therefore, once again, what the person skilled in the art would interpret the patent as teaching. As such, the Court considered that the skilled addressee would:

> "easily recognize that the coil spring is only proposed for the reason that it is an elastic cylindrical body which may be quickly rotated in the arcuate state and, above all, for the reason that it features ... means that stretch the surface of the body to form gaps at the convex side, while at the concave side they result in clamping areas with the help of which the hairs that entered the gaps may be clamped and plucked."[99]

Therefore, the claim is considered to provide functional information to the skilled addressee concerning the operation of the patent. Critically, the basic thesis is that "a person skilled in the art will not interpret the coil as a spring, but as an elastic body with gaps ... as it is obvious that the helical spring is not used as a spring per se".[100] The main issue is thus not a matter of assuming that the patentee must have intended to restrict his claim to the precise wording used unless there is clear evidence to the contrary. Rather, it is that the claim should be interpreted with function in mind. This approach is similar to that proposed by Lord Reid in *Van der Lely* and *Rodi &*

---

[98] *(1993) 24 IIC 838* at 841.

[99] *Ibid.* at 843.

[100] *Ibid.*

Wienenberger (discussed in Chapter I, above) in that it reflects the difficulties in drafting all encompassing claims from the outset. The only thing that is essential, once it has been ascertained that the spring is not operating as a power source and functions solely to pluck the hair, is that hair must be able to "enter between adjacent areas of the body (walls), and that the walls must approach it up to clamping it."[101] Given the function of the spring, the substitution of a slotted rubber rod was clearly obvious and therefore fell within the scope of protection. As we shall see when we come to consider the British litigation in this case, the outcome there was somewhat different.

The important factor here is that the German Court approached the problem from the point of view of operating the invention. Therefore, the question of whether the scope of protection should be extended from the literal wording of the claims to cover obvious variants does not hinge on the 'intent' of the drafter, as is the case under the 'traditional' British approach, discussed in Chapter I (above), as intention is assumed. By focussing on rewarding inventive efforts, the German courts necessarily provide an opportunity for broader protection than would be available where the rationale for the grant is based on other considerations.

However, such an approach cannot be dismissed 'out-of-hand' as inconsistent with the Protocol, despite its obvious links to 'Third Period' interpretative practices, as it is clear that the claims function to define the scope of protection. Furthermore, a middle ground is, in fact, trodden between giving them a literal interpretation and using them only as guidelines. The fact that there was a different outcome in the German and British legs of the *'Epilady'* litigation does not alter this fact. Brändle makes the point succinctly when he states that a solution to the problem must be found that ensures "if not identical application of the law in all countries, then at least *legal certainty*."[102] [emphasis in original]

Implications and Recent Practice

Brändle's point is really the key issue. The aim need not be conformity of decision, for it is evident that even when national courts consider patent infringement cases different

---

[101] *Ibid.* at 844.

[102] Brändle, *Can and May Interpretation and Determination of the Extent of Protection of a European Patent in Different Countries Lead to Different Results?* (1999) 30 IIC 875, (hereinafter Brändle, *Can and May*) at 878.

interpretations may be placed upon identical claims by different judges. Rather, the goal should be a certain degree of predictability.

In more recent decisions in Germany, commentators have noted that the approach adopted is moving towards a more *Catnic*-like application of the legal principles. Indeed, Franzosi goes as far as asking "*Will Europe Adopt Catnic?*"[103] and points to a decision of the German Supreme Court in which reference has been made to the British case. Thus, in *Müller-Hilty*,[104] the *Bundesgerichtshof* stated that the correct approach to the determination of the scope of protection of a patent was to ask whether:

> "The means used in the contested embodiment, instead of the means expressly recommended in the patent, serve to solve the concrete problem set in the patent and achieve the effect intended by the patent at least essentially. These principles ... correspond to the principle developed in English case law within the framework of the so-called *Catnic* questions... Modifications are outside the scope of protection if they have a significant effect on the functions of the invention..."[105]

However, this is little other than illustration of the German Court acknowledging the existence of the general *Catnic* approach and falls seriously short of providing evidence that it is applied as Franzosi seems to suggest. Therefore, his closing comments that "In the end, I would not be surprised if in Europe everybody applies *Catnic*,"[106] appear, at the time he was writing, to have been somewhat premature. This said, he does note that even if this test is adopted for all of Europe it does not guarantee, and nor would he expect, "uniformity because of that."[107]

Engel takes a more realistic view of the subject and, rather than making any great proclamations about shifting to a British viewpoint, concentrates on establishing trends in the concrete practice of the courts. He highlights specific terminology utilised in judgments; noting that the '*Wortsinn*', translated as the "meaning of the words" in the *Ion Analysis* decision,[108] "is intended to express the notion that the examination of an infringement should not be tied to the literal wording of the claims, but should be based on its identifiable meaning... The decisive factor is not the philological meaning of the

---

[103] Franzosi, *Three European Cases on Equivalence – Will Europe Adopt Catnic?* (2001) 32 IIC 113.

[104] *Spannschraube*, [1999] GRUR 909.

[105] Quoted from Franzosi, *op cit.* at 120.

[106] *Ibid.* at 123.

[107] *Ibid.*

[108] (1991) 22 IIC 249.

wording but rather the technical sense that the person skilled derives from the claims."[109] Therefore, whilst it is clear that Engel believes the Third Period practice of detaching the scope of protection from the wording of the claims is firmly behind the German courts, it would still appear that a significant degree of latitude will be given to their interpretation based on the technical teaching.

Plastic Pipes

This supposition is confirmed by reference to the recent decision of the *Bundesgerichtshof* in *Plastic Pipes*[110] where the Court lays down the following three-stage test: First, does the embodiment "solve the problem addressed by the invention with means which, albeit modified, objectively have substantially similar effects"? Second, would "the skilled person, as a result of his specialised knowledge... be able to arrive at the modified means as means having substantially similar effects... based on the claim"? Finally, is the effort that the skilled person has to make "based on the sense of the technical teaching protected in the claim, so that he considers the differing embodiment with its modified means to be a solution equivalent to that of the patent"?[111] The reader may note that this expression bears more than a passing resemblance to the questions formulated by Hoffmann, J., in *Improver v Remington*[112] and utilised by the British courts. Yet, the focus of the assessment is defined more in terms of equivalency than is the case in the U.K., thus reflecting the German courts' past interpretative tradition. However, the references to the skilled addressee being able to divine the technical solution "based on the claims" is clear evidence that the move from the 'uncertain practices' of the Third Period, started in *Formstein*, is maintained in current decisions.

The *Plastic Pipes* case also provides another example of the German Supreme Court referring explicitly to *Catnic*. However, interestingly it latches on to the approach taken by Lord Diplock as authority for the proposition that the decisive factor in the construction of the claim is the semantic context of the patent determined using the description and the drawings. Therefore, rather than simply adhering to the patentee's alleged intention in drafting the claim, the Court asks whether, given the purpose of the

---

[109] Engel, *The "Wortsinn" of Patent Claims in German Case Law on Patent Infringement Disputes*, (2003) 34 IIC 233 at 235.

[110] [2003] ENPR 163.

[111] *Ibid.* at 169.

[112] [1990] FSR 181. Discussed in more detail in Chapter IX, below.

invention, the skilled addressee would consider that protection extends to the accused embodiment. As we shall see, in Chapter IX (below), this approach is strikingly similar to the dissenting judgment of Aldous, LJ. in *Wheatley v Drillsafe*,[113] and provides for an interesting comparison.

Once again, the issue is approached from a position that places emphasis on the concept of fairness. The skilled addressee expects the patentee to have intended to cover all embodiments that are made obvious by the claims. Therefore, as long as the principles of construction are well known, the requirement of certainty is fulfilled. This presumption of intention is rebuttable where the claims are precise in their scope, and where the desire to confine protection in this manner would be plain to the skilled addressee. However, the patentee is still afforded protection consummate with their contribution to the art. Such an approach graphically illustrates the Court's perceived focus of the grant, which, based on historical and economic analysis, must be to encourage and reward innovative activity.

Cutting Knife I

This slant on the *Catnic* decision is further illustrated by the judgment of the Supreme Court in *Cutting Knife I.*[114] Here, once again, the British test is held to be authority for the proposition that the skilled person may consider some degree of inaccuracy to be within the technical sense of a claim.

The case concerned a patent for a paper cutting apparatus that comprised a cutting knife co-operating with a counter knife, which were inclined at between 9 and 12 degrees to each other. In the allegedly infringing article, the blades were inclined at 8°40', i.e. just outside of the range.

Approaching the issue of construction, the *Bundesgerichtshof* stated that the essential question was whether:

> "...the skilled person, on the basis of considerations linked to the sense of the invention protected in the claims and by using his specialised knowledge, was able to arrive at the modified means used in the contested embodiment as means having

---

[113] *[2001] RPC 133.*

[114] *[2003] ENPR 309.*

> substantially similar effects in terms of solving the problem addressed by the invention."[115]

However, it then reiterated comments made in the *Handle Cord for Battery*[116] case that the requirement of certainty "ranks equally with the concept of fair protection for inventive skill", and that the claims were no longer to be merely the starting point for determining scope, but were now the "authoritative basis" for doing so.[117]

The Court also restated the three-stage test set out in *Plastic Pipes* but then, significantly, proceeded to consider what the British approach may have been in this particular case. It issued a broad statement that:

> "An embodiment can be considered to have substantially similar effects in the sense of the patent claim only if the skilled person can arrive at it as an embodiment that actually achieves not only the effect of a feature of the invention that is numerically limited in the claim but also the very effect which he understands to be inherent in the numerical limitation of this feature according to the claim. If that is not the case, an embodiment even having otherwise substantially similar effects – both objectively, and technically as perceived by the skilled person – is essentially not covered by the extent of protection conferred by the patent."[118]

And concluded that, in order to establish whether infringement had taken place, the U.K. courts:

> "...agreeing with the above in essence, considered whether the reader skilled in the art could expect and be prepared for strict compliance with the primary meaning of the patent claim to be an essential requirement of the invention... In relation to a single feature in the patent claim, what is important is whether the feature in question appears to the skilled person to be one that can be used only literally if the practical technical teaching claimed is to be followed."[119]

Therefore, it is clear that despite paying lip service to the British test here, the German Court is still approaching the problem from a direction in which fairness is exalted. The investigation is very definitely focussed on the claims as determining the scope of protection, but the presumption of intention, as we shall see in Chapter IX, is diametrically opposed to that operative in the U.K. The fact that the Court relates the interpretation of the claims to the *effects* of the limitations contained within it when examined by the skilled addressee is reminiscent of the 'technical teaching' test of the

---

[115] *Ibid.* at 315-6.

[116] Judgment of the Supreme Court, 3rd October, 1989. Reported at *(1991) 22 IIC 104*.

[117] See *Cutting Knife I*, *op cit.* at 316.

[118] *[2003] ENPR 309*, at 318.

[119] *Ibid.* at 318-9.

Third Period. When approached with the presumption that the patentee must have intended to include all obvious variants within their claim unless the contrary is conclusively demonstrated, this results in a broad, reward-based, interpretation of the claims.

Thus, when the Court came to apply these principles of construction to the facts of the case, rather than interpreting the numerical values as decisive cut-off points so that any deviation outside of these boundaries represented a failure to adopt an essential element,[120] it looked to the effect of the restrictions. Therefore, the Court examined the purpose of angling the cutting blades at between 9° and 12°, and concluded that this was to ensure a smooth cut. It then stated that this benefit was also achieved when the angle was slightly more acute. Therefore, when considering whether an angle of less than 9° was outside of the scope of protection, the Court stated that where:

> "...a specific range was stipulated in a patent claim and there was nothing in the patent specification to suggest that the values claimed might be meant only by way of an example, the skilled person would generally have no reason to consider whether the invention might be capable of being performed even if other values were selected. The situation was, however, inevitably rather different with values that lay only so minimally outside of the range stated in the patent that there seemed from the outset to be *absolutely no likelihood of the effect being significantly modified.*"[121] (emphasis supplied)

The focus on the effect of the variant is interesting as it suggests that the primary question is whether the defendant's modification is within the teaching of the patent rather than within the claim *per se* – an approach that is strikingly similar to Lord Reid's formulation in *Van der Lely v Bamfords.*[122] The fundamental consideration therefore remains fairness to the patentee. However, by ensuring that the test is based on objective considerations, the Court safeguards predictability of result. The effect of the judgment is to confirm Franzosi's suspicion that adoption of a single test would not necessarily result in conformity of decision across Europe, for as we shall see it is unlikely that this result would be forthcoming if litigated in the British courts.

---

[120] This is the interpretation that the U.K. Patents Court places upon a numerical range in *Auchinloss v Agricultural and Veterinary Supplies, [1997] RPC 649.*

[121] *Cutting Knife I, op cit.* at 320.

[122] *[1963] RPC 61.* Discussed at notes 39 to 42 in Chapter I, above.

Conclusion

The German experience provides graphic illustration of an alternative approach to the relatively strict literalism of the 'traditional' British approach to claim interpretation. The fact that the German courts have traditionally viewed the determination of patent scope from the point of view of rewarding the patentee is significant, for this necessarily leads to a broader interpretation even when using the same tests) than when the patent is viewed as an exception to an otherwise absolute prohibition on monopoly. The 'runaway' protection of the Second and Third Periods has, to a great extent, been brought under control by the tenacity of the Supreme Court, and it is undeniable that current practice does accord with the Protocol. However, as Franzosi notes, this does not necessarily mean that there will be 'harmonisation' in the strict sense of the word. Indeed, it is debatable whether this is actually needed at all, for as Brändle states,[1-3] what is needed is *certainty* and this is something altogether different. The current German approach provides this certainty in a manner that is less objectionable i.e. more objectively verifiable than the arguably 'fairer' protection of the Second and Third Periods. The initial uncertainties, caused in no small amount due to the very fact that change was implemented at all, have now settled to a point were the *Bundesgerichtshof* is content to make a direct comparison to the 'British' way of thinking. Furthermore, this is not made with the intent of exposing a different view, for the references in recent decisions expose what the Court obviously believes to be conformity of approach. However, the point still remains that the question of construction is considered with a benevolent eye that tends towards broad interpretation.

Therefore, the question that remains is whether the balance of certainty and fairness is an objective that can be fulfilled by other means. We have already seen, in Chapter IV, that the patent grant may have a value independent of scope, for the simple fact that it is a patent. We have also seen that the provision of broad protection, based on the uncertain concept of the 'general inventive idea' did not stifle Germany's technological growth to any major extent during the Second and Third Periods. Therefore, it is sensible to now question whether the effectiveness of the system may be affected by interpretation at the opposite end of the spectrum, i.e. that which is very narrow. In

---

[1-] Brändle, *Can and May*, *passim* at 878.

order to provide an answer, we now turn our attention to Japan, and its tradition of 'sub-literal' interpretative practices.

CHAPTER VIII

Japan

-

"And We Shall Have Patents"

"We have looked about us to see what nations are the greatest, so that we can be like them ... We said, "What is it that makes the United States such a great nation?" and we investigated and found that it was patents, and we shall have patents."

– Korekiyo Takahashi, Founder of the Modern Japanese Patent Law

Of the three patent systems that comprise the modern triptych,[1] the Japanese is easily the most esoteric when viewed from a common law perspective. The current law[2] was enacted in 1959 and, although somewhat harmonised to a world standard by international agreements such as TRIPS, still maintains certain features that mark it out as distinct from the other systems that we have considered. The most important distinction from our point of view is Japan's novel approach to the determination of patent scope.

Article 70 of the 1959 Patent Ordinance inserted, for the first time, a requirement into the substantive law that the courts should determine the technical scope of an invention, and therefore the breadth of protection, by reference to the claim[3]. Previous to this, patent scope was decided by reference to the disclosure in the specification, a practice akin to the traditional German approach to claim interpretation.[4] However, the promotion of the claims in the 1959 legislation did little to change the institutionalised perception that Japanese patents were fundamentally narrow in scope.

The traditional Japanese attitude to claim drafting and interpretation is aptly summed up by Takura, who notes that there are three positions that may be adopted in the determination of the scope of a patent. The first is that of literal interpretation; this, he explains, emphasises the importance of legal certainty. The second is to afford the claims a 'supra-literal' interpretation, expanding the patent's scope beyond their precise wording, thereby emphasising the importance of protecting the right holder. Both of these approaches will be familiar to the reader, the former being a description of the traditional British process, and the latter the traditional German one. The third, it would appear is peculiar to Japan. It calls for a 'sub-literal' interpretation, providing for a narrower understanding of the claim than the actual wording would suggest, and emphasises protection of the general public. As Takura states: "It is only a matter of

---

[1] Namely the U.S., European and Japanese systems, whose combined output amounts to approximately 90% of the world total – see Isayama, *Japan's Views on a Desirable IP System for the Global Economy*, (1999) 2 Journal of World Intellectual Property 679 at 685.

[2] *Tokkyoho* (Patent Law) (Law No 121, 1959).

[3] At this point in time the Japanese patent system only allowed applications to contain one claim.

[4] See Takenaka, *Interpreting Patent Claims: The United States, Germany and Japan*, Vol. 17 Studies in Industrial Property and Copyright Law (1995; Max Planck Institute for Foreign and International Patent, Copyright and Competition Law, Munich) (hereinafter Takenaka, *Interpreting Claims*) at 193.

course that an application should be given a high appreciation, if it is far from any prior art, by anyone's judgement... [However, if it is not then] the closer the invention is ..., the more limited the protection ought to be."[5]

He continues, giving examples of where the court has followed this seemingly unorthodox pathway. Thus, in the case of "thin token lender in a game center"[6] the Osaka District Court ruled that "the scope of protection should be limited to what is indicated in the working example."[7]

Therefore, despite the fact that the 1959 Patent Law Ordinance stipulated, in Article 70, that the scope of the invention be determined by reference to the claim(s), it is clear that as late as 1990 the claim was still simply being utilised as a guiding principle, to be remoulded at will. This malleability of claim language is reminiscent of the traditional German practice of utilising the claims to identify the general inventive idea and then extending protection from this point;[8] however, importantly in Japan protection was introverted rather than expanded. Thus, as Takenaka states, the claims were considered to provide a succinct summary of the invention, and little more. "[T]he scope of protection had to be decided on the basis of the entire application including the specification and drawings."[9]

Therefore, the Japanese system gave protection to what the inventor realised he had invented, and thus had fully disclosed in the specification.[10] This limiting principle

---

[5] Takura, *Japanese Claim Interpretation, (1994) 19(5) AIPPI Journal 215* at 215. This approach is similar in underlying principle to the course of action taken by the House of Lords in *Biogen v Medeva [1997] RPC 1*, where their Lordships, by an exercise of semantic gymnastics, imported the requirement of s.14(5) PA 1977 (that the claims must be supported by the description) into the grounds of invalidity found in s.72(1)(c) (that the patent must contain an enabling disclosure). However, whereas their Lordships revoked the patent, the Japanese courts merely restrict the scope of protection that it provides.

[6] Token Lender – *Ace Denken KK v. Yuai Shoji* – p. 113 Hanrei Jihou (Law Report) Nº 1390 (19th July 1990).

[7] Takura, *op cit.* at 216.

[8] For a discussion of the traditional German approach see Chapter VII, above.

[9] Takenaka, *Interpreting Claims, op cit.* at 194. Referring to Nakayama, *Chukai Tokkyoho* (Detailed Explanation of Patent Law) (1983; Seirin shoin Publishing, Tokyo) at 520.

[10] This practice of limiting patent scope based on the disclosure in the specification rather than the wording of the claims is often labelled the 'inventor's recognition theory' (*ninshiki gendo ron*). See, for

suppresses the breadth of any patent, as the patentee may only claim protection for what he has actually created and therefore fully disclosed to the public. As an ideology, it fits very well with an economic model that promotes importation and assimilation of technology, a kind of legalised piracy promoting patent clusters,[11] rather than giving incentive to create pioneer inventions. In order to understand why the Japanese law took and maintained this unique shape well into the 1990s we must first consider the historical context in which the seed for Japan's legal protection of inventions was first planted.

Brief History

Japan originally introduced a viable patent system in 1885,[12] some 95 years after the US had instituted similar protection, and 260 years after the Statute of Monopolies had declared that legitimate patents of invention were not to be condemned as abuses of Crown prerogative. As such, Japan was a relative latecomer in the patent law stakes; what Kahn calls a patent follower country.[13] This tardy adoption of legal protection for inventions, and the eventual shape that the system took once created, can, at least in part, be ascribed to the particular political and cultural influences that prevailed in Japan from the late 16th century until the mid-1800s. It is therefore to this period that we briefly direct our attention.[14]

---

example, Takenaka, *Interpreting Claims*, *ibid.* at 66. Also, Nakayama, *op cit.* at 673. And Yoshifuji, *Tokkyojo Gaisetsu* (Outline of Patent Law) (1994; Yuhikaku, Tokyo, 8th Ed.) at 394. The latter two are sourced from Takenaka, *idem.*

[11] i.e. the grouping around any inventive concept of patents that are narrow in scope and claim only incremental advances over the prior art.

[12] *Tokkyo Senbai Jorei* (Exclusive Selling Patent Ordinance) (Law № 7, 1885)

[13] Kahn, *Intellectual Property and Economic Development: Lessions from American and European History*, Study Paper 1a of the Commission on Intellectual Property Rights. This can be found at: http://www.iprcommission.org/papers/text/study_papers/sp1a_khan_study.txt.

[14] The following discussion of the history of Japan is, to a great extent, based on that found in the Encyclopaedia Britannica. "Japan"; *Encyclopædia Britannica Online.* This can be found at: http://www.search.eb.com/eb/article?eu=109537. In addition, basic information on the History of Japan can be found in the pages of Japan-guide.com. The history index can be found at http://www.japan-guide.com/e/e641.html.

Towards Isolation

The 16th century had been a troublesome period in Japanese history. Intense conflict between powerful daimyo (landholding military lords) had wracked the land, and the traditional feudal system was in a state of steady decline. By the mid 1500s, the civil wars of the previous century had moved into an even fiercer stage of conflict as daimyo struggled to consolidate power by expansion of their domains. Eventually, one warlord, Oda Nobunaga of Owari province, succeeded in capturing the capital (Kyoto) as first feudal unifier in 1568. Nobunaga's regime was marked by bold wars of suppression waged against other daimyos and any other pockets of resistance.

By 1590 Nobunaga's successor, Hideyoshi, had all of Japan under his control, and had proclaimed himself Taiko (chancellor) feeling constrained by lineage not to take the title of Shogun.[15] Hideyoshi died in 1598, but failed to bequeath power to his heir, Hidoyori. A bitter power struggle ensued between Hidoyori and Tokugawa Ieyasu, Hideyoshi's most powerful daimyo. Matters came to a head in 1600 at the battle of Sekigahara where Ieyasu won a decisive victory, and therefore control of Japan. Aware of Hidoyori's continued influence, he reduced him to daimyo of the Kinki (Osaka) district far from his family's traditional seat of power. In 1603 the Emperor appointed Tokugawa Ieyasu to the position of shogun. The appointment ushered in over 250 years of Tokugawa shogunate rule.

Ieyasu established his government at Edo (Tokyo)[16] and brought the country under tight control. Attracted by trade as a source of wealth and military strength, Ieyasu was initially tolerant of Christian teachings[17], but later came to fear such 'risky thinking', realising that Christian policy threatened the highly organised feudal system that was the key to much of the shogun's power. In addition, Ieyasu is said to have feared that the Christians would join with Hidoyori and resist his government. Therefore in 1612 and 1614 he issued decrees to prohibit the spread of Christianity, and in 1615 he made a decisive strike at Osaka Castle, destroying Hidoyori and the Toyotomi family.

---

[15] Hideyoshi was the son of a peasant who had risen through the ranks of Nobunaga's aides due to his outstanding talent in the art of war. The Shogun was traditionally one of noble blood.

[16] Thus giving the era of Tokugawa rule its alternative title: The Edo bakufu.

[17] That inevitably came twinned with trade from Portugal and other Western nations.

Under Ieyasu's successors this policy against Christian teaching became much more severe, manifesting itself in the 1630s with the issuance of a number of directives enforcing a policy of national seclusion at the expense of trade. Thus in 1635 the Japanese were forbidden to make journeys overseas or indeed return from abroad. In 1639 Portuguese ships were forbidden to visit Japan and trade with the outside world was reduced to limited links with the Dutch and Chinese through the port of Nagasaki. Furthermore, all foreign literature was banned. In the early 18th century a law was even proclaimed that prohibited the manufacture of any new product based on new technology in Japan.[18] In short, for the next 200 years the country was almost entirely isolated from the outside world.

The impact of this seclusion policy was profound. To begin with it was instrumental in enabling the Tokugawa shogunate to establish almost 300 years of peace. It cemented the power of the shogun by enforcing a strict hierarchical system of social interaction, with the shogun and daimyos at the top and the peasant classes at the bottom. However, it also led to severe technological retardation. As a consequence Japan missed out on the developments ushered in by the Industrial Revolution that had swept across Europe and the United States by this time, and by the close of the 18th century was still tilling the land as it had always done.

From Abstention to Acceptance – Isolation's End

By the mid-1800s external pressure for reform was strong,[19] and in 1858 the Tokugawa shogunate government finally bowed to the combined weight of the US, Great Britain, Germany and France, and opened its doors to overseas commerce. Japan suddenly found itself as a feudal economy thrust into an industrialised world in which it could not compete.

---

[18] *Shinkihatto no ofuregaki* (Ordinance Prohibiting Innovations), Ordinance of the Military Government of July 1721. See Rahn, *The Role of Industrial Property in Economic Development: The Japanese Experience, (1983) 14 IIC 449* at 453 (hereinafter Rahn, *The Japanese Experience*). Rahn confusingly states in the main body of the text that law was passed in 1718. The citation given above is taken from the footnote. See also Kumagai, *History of Japanese Industrial Property System*, A Joint Production of the Japanese Patent Office and the Asia-Pacific Industrial Property Centre (1999) (hereinafter Kumagai), at 2. This can be found at: http://www.apic.jiii.or.jp/facility/text/1-07.pdf.

[19] Including the famous display of American naval might perpetrated by Admiral Matthew C. Perry and his fleet of warships that entered Uraga Bay in July 1853.

The impact that Japan's opening had on its culture was profound; feudalism was simply unable to survive the onslaught. As a result the Edo government, with its power so firmly based in this type of rigid economy, collapsed amidst bitter internal conflict. However, before its demise it entered into a number of 'unequal treaties' with the Western powers in an attempt to gain a trading foothold. These 'agreements' were heavily biased, and granted outside nations extraterritoriality whilst depriving Japan of its own tariff levying rights.[20] The repeal of these 'humiliating' treaties is stated by Rahn to have been one of the "overriding political objectives of the Meiji state during its first decades."[21]

A Return to Imperial Rule

The Meiji Restoration is the title commonly applied by Western scholars to the political changes that returned power to the Imperial House in 1868.[22] It is in this period that we see the start of sweeping reforms, both legal and institutional, aimed at modernising an essentially Mediaeval Japan. Rahn notes that the "Japanese embarked on a feat of learning by borrowing," taking the United States and Europe as their models.[23] Therefore, the early years of the Meiji Restoration are marked with rapid assimilation of foreign technology. However, it is clear that although significant advances were being made, the country was still a long way behind the West. In order to spur on advancement, therefore, it was not sufficient to simply continue appropriating technology from abroad; Japan had to entice foreign investment, and to do this it had to offer some degree of protection from competition. In addition, a number of famous cases in which Japanese inventors had the profit of their inventions misappropriated – such as that of Tatchi Gaun,[24] the inventor of a prize-winning Japanese-style spinning

---

[20] See Kumagai, *op cit.* at 7. Also see Rahn, *The Japanese Experience, op cit.* at 461-2. The main treaties in question were the Treaty of Kanagawa (also known as the Perry Convention, 1854) and the Harris Treaty (1858), see 'Japan'; *Encyclopædia Britannica Online.* at: http://www.search.eb.com/eb/article?eu=109537.

[21] Rahn, *The Japanese Experience, op cit.* at 462.

[22] It is interesting to note that the Japanese term this period a renovation, stressing the dramatic innovative change that the country underwent.

[23] Rahn, *The Japanese Experience, op cit.* at 458.

[24] Sometimes referred to as Tokimune Gaun – see, for example Harris, *The Making of an IP Nation.* Available online at https://www.japaninc.net/article.php?articleID=951&page=3.

machine, who was reduced to poverty by the wholesale piracy his invention – had highlighted the need for some degree of protection for the creators of new things.[25]

The Protection of Invention - A False Start

As already noted, Japan introduced a working patent law in 1885. The 1885 Ordinance was not, however, the first attempt to provide protection to inventors in the Japanese state. In 1871 the Meiji Government implemented the 'Concise Regulation of Exclusive Selling'[26], based on first-to-file principles and purporting to employ preliminary examination of applications. However, Kumagai notes that this first attempt at a 'quick fix' was doomed to failure, as it was adoption of a law in the "absence of a basis for its operation."[27] Although claiming to examine applications there was actually no government office in place to accept one. Furthermore, there were no officials appointed to handle applications.[28] Additionally, the new principle was a "complete departure from the Tokugawa Shogunate government policy" of the previous 160 years, and was thus hardly accepted amongst the Japanese people.[29] The law was therefore repealed in 1872, one year after its adoption.[30]

The years that passed between 1872 and 1885 were marked with explosive advances in Japanese technological understanding. Unhindered by any form of patent protection, industry was able to progress at a remarkable rate by the assimilation of foreign technology. As Rahn notes: "A period of sweeping reform and extensive modernization [had begun]... At this time, what has now become a fixed tradition, was

---

[25] See Kondo, *Keynote Address at Symposium to Commemorate the Centennial Anniversary of Japan's Accession to the Paris Convention – Roles of the Intellectual Property Rights System in Economic Development in the Light of Japanese Economy*, *(2000) 25 AIPPI 28* (hereinafter Kondo), at 30 for a more thorough discussion of this case. See also, Kumagai, *op cit.* at 4-5.

[26] *Senbai Ryaku Kisoku*, (Law Nº 105, 1871). See Takenaka, *Interpreting Claims*, *op cit.* at 40. Rahn, *The Japanese Experience*, *op cit.* at 460 calls this Ordinance the "Summary Rules of Monopoly". See also Kumagai, *op cit.* at 3.

[27] Kumagai, *ibid.*

[28] See Kumagai, *ibid.* at 4. Also Heath, *Commercialising University Inventions in Japan*, A publication of the Max Planck Institute, Munich. Available online at http://www.cmmi.gr.jp/jalo4/pdf/heath.pdf. [Accessed 16th June 2003].

[29] Kumagai, *op cit.* at 3-4.

[30] As Rahn states, it is proof that it is "impossible to create a functioning patent system out of nothing by just promulgating a law." Rahn, *The Japanese Experience*, *op cit.* at 460.

started on a grand scale: young Japanese by the thousands were sent abroad... [to study] American railways, British textiles and metallurgy, French and German law..."[31] "Foreign mania raged everywhere, and everything was manufactured in imitation of foreign articles."[32]

The 1885 Ordinance

The 1885 Ordinance is one of a number of Statutes that marked a new period in Japanese legal philosophy. As noted above, earlier attempts at founding systematic protection for invention had failed due to the lack of a sound institutional and theoretical basis. Put simply, the prospect of promoting technology was too great a culture shock to be sustained in the years immediately following the Tokugawa seclusion policy.

The pressures of the commercial world into which Japan has suddenly found itself thrust were too great, however, to thwart the institution of such a system for long. The disadvantage at which Japan was placed in the technology transfer stakes, alone a major hindrance to industrial progress[33], forced political and cultural change. Furthermore, the great benefits of a system for the protection of intellectual property (and inventions in particular) was apparent to all concerned with the renovation of the Japanese political structure during the Meiji restoration. One account above any other brings this realisation into focus. Upon visiting the United States to study the American patent system Korekiyo Takahashi, the founder of modern Japanese intellectual property law, is quoted as saying: "We have looked about us to see what nations are the greatest, so that we can be like them ... We said, "What is it that makes the United States such a great nation?" and we investigated and found that it was patents, and we shall have patents."[34]

---

[31] Rahn, *The Japanese Experience, op cit.* at 458.

[32] Lockwood, *The Economic Development of Japan: Growth and Structural Change (1868-1938)*, (1954; Princeton University Press, Princeton) at 326. Quoted from Rahn, *The Japanese Experience, op cit.* at 459.

[33] The reader will no-doubt recall the lengths to which the English crown went to remedy a similar technological lag. See Chapter II, above.

[34] See U.S. Department of Commerce, Patent Office, *The story of the United States Patent Office*, (1972; U.S. Department of Commerce, Washington). See also Hayashi, *Comparative Study on Patent Systems between US and Japan – 1987 and 1993 Revisions in Japan, (1995) 20(4) AIPPI Journal 171* at 171; Rahn, *The Japanese Experience, op cit.* at 450 and; Vaver, *The future of Intellectual Property Law: Japanese and European Perspectives*

Despite this forthright declaration of pro-American technology policy, it is apparent that the structure of the 1885 Ordinance owed a great deal to both the American and Continental European patent systems. As Kumagai states, the requirement in the Ordinance that the applicant file a description specifying the scope of the invention[35] was a distinctly American concept, however the choice of term of the patent (a maximum of 15 years) and the "invalidation of a patent right due to non-use were adopted from the French patent law."[36] In addition to these features, the Ordinance called for the adoption of the principle of examination, required that the invention be novel and useful and stipulated that there could only be one invention per application.[37] It also deemed inventions contrary to public order or relating to pharmaceuticals not to be patentable.[38]

The Ordinance of 1885 represents a great step forward in the invention of a modern Japan. It is clear evidence of a country wishing to advance and embracing the opportunities that modern technology has to offer.

Compared – Text of a talk given at the Third Oxford University Academy Salon at Academy Hills, Tokyo, 13th April 1999. This can be found at http://www.oiprc.ox.ac.uk/EJWP0999.html.

[35] Notice Nº 5 of the Exclusive Selling Patent Procedure 1885 (*Senbai Tokkyo Tetsuzki*) stated that the procedure for applying for a patent "... requires the inclusion in an application of a description specifying the scope of the invention. It is recommended that the phrase "the scope that is claimed for a grant of patent regarding this invention" be used." See Takenaka, *Interpreting Claims*, *op cit.* at 40.

[36] Kumagai, *op cit.* at 5-6. Also Heath, *Enforcement of Patent Rights in Japan (2000) 31 IIC 749* at 751, noting the influence of Continental European legal systems on early Japanese patent law. Additionally, it is interesting to note the wider influence of the Continental European legal system (particularly that of Germany) on the Japanese reforms of the Meiji era. Britannica states that: "Many Japanese believed that constitutions provided the unity that gave Western nations their strength." A constitution was finally drafted, which was published in 1889. The commission that was responsible for its creation was headed by Ito Hirobumi, and aided by the German constitutional scholar Hermann Roesler. In preparation for the drafting, Ito travelled widely in Europe and it is said that "[i]n Germany he found an appropriate balance of imperial power and constitutional forms that seemed to offer modernity without sacrificing effective control." – see "Japan"; *Encyclopædia Britannica Online;* http://www.search.eb.com/eb/article?eu=109537.

[37] This principle added to the perception of the Japanese patent system as one that granted very narrow rights, as it limited the applicant to one claim per patent.

[38] See Kumagai, *op cit.* at 6 for a brief discussion of the main features of the 1885 Ordinance.

American Influences

The influence of American patent law policy at this point in time was strong. In 1888, for example, the patent law was revised to include the first-to-invent principle. Provision was also made for the annulment of a patent if the invention was not new, or "if the specification contained incomplete or superfluous disclosure."[39] In addition, interference procedures, strongly reminiscent of American practice at the time, were introduced. Furthermore, as Takenaka states: "The theory that a patent constitutes a substantive right also shows strong American influence, because Japanese patent law at that time regarded a patent as a right to exclude others"[40] in the same way that U.S. patent law did.[41] German and French law, on the other hand, regarded the right not only to exclude, but also to exploit the patented invention.[42] However, although American influence was predominant at this point in time, it is clear that the law shows what Vojáček describes as the "wise eclecticism of Japanese legislators," as many provisions were copied from other countries.[43]

National Favouritism – A Lesson from the West?

However, despite evidence of foreign influence in the shaping of patent law and policy, there remained a number of peculiarly Japanese practices connected with the granting of patents. Vestiges of the Tokugawa shogunate's seclusion policy can be seen to have survived the Restoration in that, although not specifically prohibited in any Ordinance, foreigners could not, at least in the early years of the system, file a patent application with the Japanese Patent Office.[44] This principle of national favouritism appears to have been a calculated manoeuvre intended to rapidly improve Japanese technological standing; operating in much the same manner as the importation of valuable ideas that had improved England's technology under Elizabeth the First.[45] In addition, it also

---

[39] See Vojáček, *A Survey of the Principal National Patent Systems*, (1936; Prentice Hall, New York) (hereinafter Vojáček) at 159. He discusses Japan at 159-65.

[40] Takenaka, *Interpreting Claims*, *op cit.* at 41.

[41] *Tokkyo Senbai Jorei* (Exclusive Selling Patent Ordinance) (Law № 84, 1888); Article 1 provided "A patent means granting an inventor a special right to exclude unauthorized people from making, using and selling the patented invention." Taken from Takenaka, *Interpreting Claims*, *op cit.* at 41.

[42] See the discussion of the Early German patent system in Chapter VII, above.

[43] Predominantly France, Germany and Britain. See Vojáček, *op cit.* at 160.

[44] See Kondo, *op cit.* at 30; See also Kumagai, *op cit.* at 6.

[45] See further, Chapter II, above.

gave Japan a powerful bargaining tool in the renegotiation of the 'unequal treaties' signed in 1858 when Japan first opened its doors to the West at the end of the period of seclusion.[46]

It will be recalled that, when implementing a similar policy in the mid-16th century, England had the benefit of being amongst the first to instigate a system for the promulgation and promotion of invention by the offer of time-limited monopoly. There was no external agenda to contend with, no pressure for conformity at an international level, and no fiction of the *right* to protection. England could concentrate on self-improvement without fear of recrimination, content in the knowledge that, to all intents and purposes, the country's business was its business alone. The Crown could tailor the scope of the grant, and, most importantly, settle upon a recipient by exercising prejudice and policy with impunity. Japan was not so fortunate. By the point at which it entered the international arena the times had changed, and the impossibility of maintaining a xenophobic patent policy (despite the benefits that it offered) was clear. However, it appears that it was too good an opportunity to overlook completely.

The reason that national favouritism held such allure, and one possible explanation of the shape that the system took once such a policy was rendered impossible by Japan's accession to the Paris Convention in 1899, can be ascertained if we look towards the alternative. One of the fundamental qualities of an *open*[47] intellectual property system is that anyone can apply for, and be granted, protection for their creation as long as it meets certain objective criteria. This provides what would commonly be regarded as a 'fair' system, a meritocracy, and this is clearly the case where the field on which the entities vying for protection is reasonably level. However, in the situation in which Japan found itself at the end of the nineteenth century, the field was perilously steep.

It will be recalled that one of the fundamental complaints concerning the British patent system during the 'Patent Controversy' of the mid-nineteenth century concerned its interaction with England's trading partners in the international dimension.[48] A powerful

---

[46] See Rahn, *The Japanese Experience*, *op cit.* at 461-2.

[47] The term 'open' is used to denote a system that adheres to the principle of national treatment – i.e. that all applications are treated equally, regardless of whether they are from foreign or national applicants.

[48] See Chapter III, above.

argument dispatched against the system was that other significant players on the European trade scene were exploiting British technology by piracy. This criticism was particularly levelled against Germany, as it had no patent system itself until 1877. The argument was, to a varying extent, used by both sides to justify their arguments for, or against, the system depending on where it was focussed. The anti-patent lobby stating that Europe should be on equal footing, that it was unfair that European industry should be able to exploit their British counterparts' inventions free of charge. The pro-patent lobby introducing 'defectors' such as Bessemer and Siemens to attest to the success of the British system in enticing talent such as theirs to the country. However, critical to the success of the pro-patent lobby was the simple fact that the patent system was already in place, to abolish it would have resulted in a significant, and unquantifiable, change in the *status quo.*

The situation that faced Japan was, in many respects, diametrically opposed to that of Britain in this period. There were some similarities, but there were more fundamental differences. Crucially, Japan was a country that was racing to catch up; it was a country whose economy was struggling to change from feudalism to embrace industrialisation. Therefore, whereas Britain was technologically advanced and was concerned with overseas piracy, Japan was retarded, floundering in the international mire and fixated on developing domestic industry. Successfully competing on the international stage was not an option, but competition from international players and the resultant strangulation of domestic interests was a harrowing plausibility. For, whilst it may be true that a strong *open* patent system encourages domestic innovation and the disclosure of information when the country in question is developed, when it is not it simply provides security for foreign businesses wishing to open up new markets. Strong protection of such interests will clearly lead to new technology being introduced into the state in question but, critically, it will be introduced at a premium price, and then only if there is considered to be a market for it. Therefore, the home nation only receives the (delayed) benefit of innovation deemed by external forces to be economically viable.

Domestic industry does not directly benefit from this sort of bargain as it cannot (generally) make the jumps in technology that are required to get ahead of the pack, let alone to maintain this position if it gets there. Instead, it is left to pick the bones,

becoming reliant on external innovation without being able to learn by improving. Once established, piracy is taboo. However, on the road to establishment it is an aid of unparalleled efficacy in educating and developing a nation's technological standing. Indeed, if we look at the birth of the patent system in England then we see that great advance was made through this very practice, through the systematic importation of knowledge from abroad. However, whilst Britain was free to dictate its own fortunes and form an innovation policy that benefited no-one but itself, Japan had emerged from the dark years of seclusion into an arena governed by international trade and subject to a new world order. External pressure from the international community for the 'equal' protection of inventions was strong. [49] On patent matters, therefore, it was clearly caught between a rock and a hard place. It recognised the need to advance technology and the benefits that a system of granting temporary monopolies could provide. In addition, it was clear that foreign investment and the introduction of overseas inventions was needed, however, it would have been equally clear that there were significant dangers and disadvantages to domestic industry if the protection offered was too strong. Therefore, by initially prohibiting foreign interests from receiving patent protection, Japan gained valuable bargaining power in the renegotiation of the 'unequal treaties' that it had entered into upon the suspension of its seclusion policy. In addition, it enabled domestic interests to defend against internal competition in a bid to spur on intellectual and industrial development. The grant of narrow rights would have been optimal in the pursuit of such a policy as these encourage incremental technological growth rather than fundamental innovation.[50]

As already noted, Japan's accession to the Paris Convention in 1899, and the patent law revision Ordinance that accompanied this, put an end to the outright prohibition upon granting protection to foreign applicants.[51] However, it is submitted that the policy

---

[49] The story of the creation of the NEC Corporation is a vivid example of the international pressure that Japan found itself under to give strong recognition to intellectual property rights. The Corporation, formed from a tie up of Nippon Electric Co. Ltd. of Japan and the Western Electric Co. Ltd. of the U.S., was created just two days after the Paris convention went into force in Japan, and included provisions on the management of intellectual property rights in its articles of incorporation. For more detail on the creation of NEC see Kondo, *op cit.* at 30

[5] And why bother to invest in fundamental innovation, a costly process, when you can import, assimilate and improve upon someone else's work?

[51] However, there was still an obligation to designate an agent residing in Japan. See Kumagai, *op cit.* at 8.

interests underpinning the principle of national favouritism, primarily the need to encourage domestic industry, were not so easily removed. Indeed, they maintained such a fundamental role in the shaping of Japanese patent law that the system was often criticised as encouraging 'follow on' inventions at the expense of fundamental innovation until well into the 1990s.[52] In short, it has been stated that "[i]n the hundred-odd years from the Meiji Era onward, the Japanese industry has developed by improving technology from abroad."[53]

Post-Convention – Incremental Development

The 1899 patent law Ordinance was the first of a series of revisions that Takenaka states demonstrate the movement from an essentially American to a Germanic system of principles regarding the scope of protection.[54] She explains that whilst the 1885 law was based on the American system and saw the patent as a right to exclude others, the 1899 revision provided that the patent gave the right to "use exclusively and distribute the patented invention", something that the American system did not.[55] This process was continued with the 1909 Ordinance, which adopted a pseudo-Germanic model of jurisdictional separation between the Patent Office and the courts,[56] and was completed with the 1921 Ordinance,[57] adopting the first-to-file system of application priority.[58]

---

[52] See Maskus & McDaniel, *Lessons from Japan for U.S. Patent Reform: Policy Implications of a Pre-Grant Disclosure System*, a Japan Information Access Project working paper (revised on 1st June 1999). Available online at: http://www.japanonline.org/publications/docs/1999/june/FINAL%20PAPER%206.1.99.pdf at 5.

[53] Sato, *Strengthening the Protection of Intellectual Property Rights to Meet the Needs of the 21st Century – Future Policy on Intellectual Property Rights*, (2001) 26(4) AIPPI Journal 199 at 200. This observation, is shared by the Commission on Intellectual Property Rights in the Twenty-first Century in its report to the Japanese Patent Office dated 7th April 1997 – *Toward the Era of Intellectual Creation: Challenges for Breakthrough.* Available online at http://www.jpo.go.jp/old/tousie/rep21eng.doc.

[54] Takenaka, *Interpreting Claims*, *op cit.* at 41. This sub-section is largely inspired by her work. However, also see Vojáček, *op cit.* at 160 to 165. On the post 1899 developments in Japanese patent law he summarises by stating that "We see clearly [in this period] ... the development of the Japanese patent system, which in its essential features inclines more and more to the German and Austrian system... [However, p]eculiar to the Japanese system are stipulations concerning ... contingencies which, as to minuteness have hardly a parallel in any other patent law...". Vojáček, *idem*, at 165.

[55] Takenaka, *Interpreting Claims*, *op cit.* at 41.

[56] Article 49, *Tokkyoho* (Patent Law) (Law No. 32, 1909). This meant that anyone wishing to invalidate a patent had to commence proceedings at the Patent Office, as per the current German model.

[57] *Tokkyoho* (Patent Law) (Law No. 96, 1921).

[58] See Kumagai, *op cit.* at 9.

However, in one important aspect the Japanese system was to retain its own specific identity.

The patent scope certification trial was introduced by the 1899 Patent Ordinance, and effectively functioned to vest interpretative power concerning the scope of protection in the Patent Office. The trial enabled the patentee to bypass the court system when questions of this kind arose, and its use may go some way to explain the very low numbers of reported patent cases in the period up to its abolishment with the 1959 Patent Ordinance.

The existence of the certification trial was very important as it functioned to erode the separation of jurisdiction envisaged by the 1909 Ordinance. As matters of interpretation were being considered by the Patent Office a situation akin to that in the UK and America[59] was effectively in existence based, however, upon German principles. Therefore, as the Patent Office took the main role in developing claim interpretation theory, the court was relegated to second fiddle. This had important repercussions for cross-jurisdictional transfer of theory between Germany and Japan, for it is clear that throughout the period that ran from the 1899 Ordinance onward the influence of the German legal system was strong. Examples of such international transfer of policy/theory are given by Takenaka and include the establishment of the concept of identification of the invention, similar to the 'general inventive idea' of the German courts, sitting at the core of interpretative theory. In addition, she mentions the classifications that the Patent Office utilised to divide modifications being almost wholesale copies of their German counterparts.[60] However, the blurring of the separation caused by the patent scope certification trial meant that whereas in Germany these principles were simple utilised to decide the scope of the patent once granted, in Japan they could also be used to deny protection.

---

[59] Where one body (in these countries the Court) has competence to decide on issues of both infringement and validity.

[60] The classifications that she mentions are "mechanical workshop modifications" (*sekkei henko*), "insignificant modification" (*sekkeijo no bisa*), "designing around the invention" (*ukai hatsumei*), and "inferior modifications" (*kaiaku jisshi*). See Takenaka, *Interpreting Claims*, *op cit.* at 42.

This factor had important repercussions for claim interpretation theory, as it effectively enabled the courts to operate unrestricted by the claims. The claims functioned to define the invention, but the disclosure made by the patentee in the rest of the specification was considered to be of more importance when the scope of protection was considered. Thus, over and above the principle of classifying modifications, the Germanic doctrine of the 'general inventive idea' was bastardised and effectively functioned to limit the scope of the patent to that explicitly recognised by the inventor, evidenced by the disclosure in the specification. This theory, often known as the 'inventor's recognition limitation theory'[61] came to be the governing doctrine in Japanese claim interpretation, and confined the protection afforded by the patent to the explicit disclosure.[62] Unlike the German system, where the general inventive idea was utilised to expand the scope of protection to those devices that could have been conceived by the skilled addressee based on the claim language and the disclosure in the specification, the Japanese 'inventor's recognition theory' operated to limit the scope of the patent to what the inventor was perceived to have intended to claim based on the disclosure in the rest of the specification.

The patent scope certification trial had removed the need to be bound by the claims by enabling the Patent Office, the forum in which the claims were drafted, to also determine their scope. The fact that the apparent separation of powers envisaged by the 1909 Ordinance did not adequately correspond to this model appears to have gone unnoticed in the years that followed its enactment, and the Patent Office continued to operate as judge, jury and executioner on matters of claim scope. It was in this respect far more powerful than the courts or Patent Offices in any of the other jurisdictions that we have considered, as it was free to re-examine and re-draft the patent as it determined its scope. Various practices arose to surround this core concept, including the determination of the gist of the invention (*hatsumei no yoshi*), which augmented the

---

[61] *Ninshiki gendoron.* See Takenaka, *Interpreting Claims, op cit.* at 43.

[62] Takenaka utilises a Judgment of 16th October 1915 (Taisho 7 № 459), stating on page 43, Note 21: "Since an application including descriptions of the nature and purpose of the invention, a detailed explanation of the invention, the scope claimed for the grant of the patent, and specified the gist of the invention and means and devices by which the invention is embodied so that he or she claimed the characteristic portions of what he described, the meaning of each element described in the claim must be interpreted with respect to the nature and purpose of the invention and the detailed description of the invention."

narrowing of protection scope by reading the limitations in the description as limitations on the claims themselves.[63]

However, this was not the end of the matter, as the Japanese courts also adopted this procedure to justify redrafting the claims in infringement proceedings "by declaring a new claim as the gist of the invention or patent."[64] The fact that the courts adopted this process served to further muddy the jurisdictional separation between the two bodies, with both entities believing that they had the power to redraft and reinterpret the claims at will.

Therefore, we see the same principles that were being used in the German courts to expand the scope of protection being used in the Japanese Patent Office in scope certification trials, and in the courts in infringement actions, to narrow the claim scope. All that the jurisdictional separation envisaged by the 1909 Ordinance succeeded in doing was to render the decisions of the Patent Office unquestionable in court. The German motivation for such a division of power was not transferred into the Japanese model, and, as such, the system preferred narrow protection.

This said, it is clear that the system was able, as and when the circumstances dictated, to expand protection on an *ad hoc* basis to minor modifications that did not appear in the description or drawings.[65] However, as Takenaka states, this "involve[d] the mechanical one-to-one exchangeability of claim elements but ... [did] not involve the equitable consideration of the patentee's interest and the public's interest in the context of the patent policy of encouraging innovation ... [so as to provide a] broad range of equivalents."[66] It is clear that such expansion of the claims was far from normal.

---

[63] Takenaka, *Interpreting Claims*, *op cit.* at 44-45.

[64] *Ibid.* at 45.

[65] An example of the *ad hoc* application of the doctrine of equivalents can be found in the decision of the Tokyo District Court of 28th September 1964 (Hanrei Nº 168). See also, Kukimoto, *The Patent Law: Chapter 3 The Patent Right*, *(2001) 26 AIPPI Journal 79* at 87.

[66] Takenaka, *Interpreting Claims*, *op cit.* at 46. Whilst this may be the case, the implicit assumption in this statement that narrow protection does not encourage innovation at all is somewhat incorrect. This point is discussed in more detail in the next section.

It may be possible that the outcome of this process was, as some commentators have claimed, based on incomplete understanding of the legal principles that were employed in its key stages of creation.[67] However, this conclusion ignores the fact that, from an economic and practical point of view, this policy of granting narrow patents was actually beneficial to Japan.[68] It would be naïve to conclude that a practice that encourages progression by imitation, therefore creating patent 'clusters'[69] and spurring on domestic industry[70] – industry that would be in danger of being strangled by broader protection – could only be based on such 'incomplete understanding'. Rather, it would appear that the system flourished, and Japan made the immense technological leap that it did in the manner that it did, precisely because of the nature and scope of the rights that the patent system granted.[71]

Cultural Formatting – Institutionalised Collectivism?

The fact that narrow protection was traditionally granted by a Japanese patent also accords very well with the wider picture of the Japanese legal culture. The honourable

---

[67] See Takenaka, *Interpreting Claims*, *op cit.* at 44 *et seq.*

[68] The conclusion that broader protection encourages more innovation is, in itself, dubious. See Sakakibara & Branstetter, *Do Stronger Patents Induce More Innovation? Evidence from the 1988 Japanese Patent Law Reforms*, NBER Working Paper Nº 7066, Apr. 1999. Available online at: http://www.nber.org/papers/w7066.pdf.

[69] Again referring to the situation whereby an inventive concept becomes surrounded by patents that are narrow in scope and claim only incremental advances over the prior art.

[70] A vivid example of an incremental innovation that nonetheless came to define an age and demonstrates the encouragement of domestic industry is that of the "Sony Walkman". The pioneer invention accompanying this advancement (tape recording) was not made in Japan, but who can remember the inventor? The "Walkman" spawned a whole host of related products, and marked its producer as one of the industry greats. For a more in-depth discussion of the invention of the "walkman", and other Japanese incremental advances that became giants in their own right see Rosen & Usui, *The Social Structure of Japanese Intellectual Property Law*, *(1994) 13 UCLA Pacific Basin Law Journal 32* (hereinafter Rosen & Usui) at 41-33.

[71] It is interesting to note that Vojáček, writing in the mid-1930s, felt able to conclude that the "present Japanese law may justly claim to be the most carefully thought out and perhaps the best modern law in the world." Takenaka's conclusion that it was based on "incomplete understanding" seems to be grounded on the assumption that anything that is not American/European is somehow wrong. This author wishes to politely suggest that this is not always the case. Indeed it would appear that Takenaka herself has also noted the undeniable benefit that the system in Japan actually had at the time. See

nature and form of all social interactions carried over into the country's legal system[72] and helped to shape the envelope of intellectual property in general, and patents in particular. Thus, the interests of society are clearly evident in the decision, explicit or not, to confine the scope of protection within narrow boundaries.[73]

The Japanese system can therefore be seen to emphasise the protection of the general public by limiting the claims to what the inventor has disclosed in the specification. This sub-literal protection also promotes another element of Japanese patent culture, that of collectivism, over and above the more Western notion of individual reward. With a system of narrow grants, patents beget patents and it is virtually impossible for one entity to control all of the technology surrounding an invention.[74] The consequent 'flooding'[75] that results from many competing applications may soon render the initial innovation impotent. Therefore, rather than doggedly defending one's territory and bringing expensive legal actions in order to ward off competitors, as is the traditional Western approach, Japanese patentees traditionally entered into cross-licenses as a matter of course.[76]

Takenaka, *The Role of the Japanese Patent System in Japanese Industry*, (1994) 13 UCLA Pacific Basin Law Journal 25.

[72] "[I]n order to obtain the highest degree of compliance possible, both judicial opinions and public laws try to find the common ground or, that magic word, "consensus" regarding any specific subject." Port, *The Spirit of Japanese Law (Book Review)*, (2002) 1 Washington University Global Studies Law Review 573 at 574, reviewing Haley, *The Spirit of Japanese Law*, (1998; University of Georgia Press, Athens, GA).

[73] See, Harris, *Competition Law and Patent Protection in Japan: A Half-Century of Progress, A New Millennium of Challenges*, (2002) 16 Colombia Journal of Asian Law 71 at 75 to 76. Also more generally, Rosen & Usui, *op cit. passim.*

[74] This narrow division of the inventive field into numerous 'thin' patents has led some critics of the Japanese system to nickname it the 'sashimi' system, after the sliced fish delicacy – see Sakakibara & Bransetter, *op cit.* at 3.

[75] A term utilised by many commentators including Rosen & Usus, *op cit.* to describe the "multitude of patent applications claiming minor, incremental changes" over previous innovations – see Sankaran, *Patent Flooding in the United States and Japan*, (2000) 40 IDEA 393 at 394. See also U.S. General Accounting Office, *Intellectual Property Rights: U.S. Companies' Patent Experiences in Japan*, GAO/GGD-93-126, at 18 (July 1993), which states that whenever a patent of value is published, competitors of the patentee will file "excessive numbers" of patents claiming minor variations, a practice known as "patent flooding."

[76] See, for example, Rosen & Usui, *op cit.* at 45-46. In addition, the empirical research undertaken by this author in relation to Chapter IV (above) confirms this stereotypical approach to technology transfer within Japan. Further, in an interview with a Japanese Patent Attorney visiting the UK this author was

This institutionalised diplomacy was vital to the success of the patent system in Japan, for without it the system would have rapidly become gridlocked. The fact that the Japanese system encourages the 'laying open' of technology may also account for the monumental progress, both technological and cultural, that the country has witnessed since the Meiji Restoration. By opening the knowledge contained in the inventive pool by effective cross-licensing, the Japanese system has gone far beyond the information/disclosure function of the patent grant itself, in effect rationalising innovation as a national rather than individual activity. This process accords with the Schumpeterian notion that large entities are conducive to innovation – i.e. the process of investing in invention – provided that they are able to satisfactorily recoup research and development costs.[77] In Japan the fact that narrow protection was granted moves the scope of protection and therefore the return on each individual innovation outside of the primal sphere of influence. The scope of the rights is therefore not as important as the fact that rights are granted in the first place. Form is championed at the expense of content. In other words, the whole process of innovation becomes one of numbers. Competitive advantage is gained, not by the quality of the advances made, but rather by the quantity of patents that can be thrown into the bargaining pot, thus shifting the focus of the patent incentive rather than replacing it entirely.[78]

---

told that that "The honourable thing to do is to come to an agreement, not to litigate. I think that this principle still applies to many patentees in Japan. They learn from their Western competitors, but it is better to trade than to fight." In addition, one of the British qualified patent attorneys interviewed in relation to Chapter IV, and with significant experience of the Japanese system stated that "The Japanese on the whole don't care [about the quality of individual grants, they] ... only want a patent, they collect them. They may amass [thousands a year] ... and bargain with them, they go to their competitors and say "we've got more than you, give us some money". They don't seem to care about the value of each one."

[77] See Schumpeter, *Theory of Economic Development*, (1936; Harvard University Press, Cambridge (Mass)). This work was first published in German as *Theorie der wirtshcaftlichen Entwicklung* (1911; Duncker Humblot, Leipzig). Discussed further in Chapter V, above.

[78] See similar conclusions concerning the efficacy of the Japanese patent system in providing incentives to innovate in Cohen *et al*, *R&D Spillovers, Patents and the Incentives to Innovate in Japan and the United States*, (Working Paper Jun. 2001). Available online at: http://www.druid.dk/conferences/nw/paper1/cohen.pdf.

Continued Pressure for Reform

This process of cannibalisation by the collective, the assimilation and improvement of (primarily foreign) technology, operated well when Japan was playing 'catch up', but it is clear that by the end of the 1950s the system, as it stood, was becoming unworkable.[79] Japan's technological progress had been explosive, moving it from the Middle Ages to a point at which it was able to compete with the Industrialised West in a period of less than 100 years. However, this growth was now in danger of being thwarted by the very system that had enabled this rapid progression: It was time for reform.

As already noted, the current incarnation of the Japanese patent law was promulgated in 1959. It implemented changes recommended by the Council for the Study of Intellectual Property System Revision, which had been installed at the Ministry of International Trade and Industry in 1950, and was designed to update the system to enable it to cope with Japan's rapid industrial progress after World War II.[80] Furthermore as Takenaka states, the Ordinance served to codify a number of judicially created principles; for example, it inserted an inventive step requirement into the substantive law.[81] In addition, it expanded the scope of the novelty provision by including overseas publications within its remit, and it made it possible to file a patent application that covered more than a single invention for the first time. It also inserted a requirement, in Article 70, that the court determine the technical scope of an invention, and therefore the breadth of protection, by reference to the claim[82]. Protection scope certification trials were also abolished, thereby transferring responsibility for claim interpretation to the courts and clarifying the jurisdictional separation envisaged by the 1909 Ordinance.

---

[79] See Kumagai, *op cit.* at 10. He states that the "laws had some provisions no longer effective to cope with the reality and unable to catch up with the country's economic and industrial development rapidly progressing in the post-war years."

[80] See Takenaka, *Interpreting Claims*, *op cit.* at 47. See also Kumagai, *op cit.* at 10.

[81] In Article 29 Paragraph 2 – "Where an invention could easily have been made prior to the filing date of the patent application by a person with ordinary skill in the art to which the invention pertains on the basis of an invention or inventions referred to in any of the paragraphs that provide the novelty requirements, a patent shall not be granted for such an invention". Translation quoted from Takenaka, *Interpreting Claims*, *ibid.* at 47. See also, Kumagai, *op cit.* at 11.

[82] At this point in time the Japanese patent system only allowed applications to contain one claim, thus seriously limiting the scope of protection.

The inclusion of Article 70 in the new law was intended to prevent the courts from re-examining the patent claim, as had been the pre-1959 practice. By inserting reference to the claim in determining the scope of protection, "the legislature aimed at forcing courts to read the claim as it was granted in infringement litigation."[83] However, as ever, legislative intent and court practice do not always see eye-to-eye, and the courts continued to utilise pre-1959 practice to limit the claims based on disclosures made elsewhere in the specification.

Subsequent revisions to the Patent Law attempted to expand the scope of protection. Therefore in 1975, a multiple claim system was introduced.[84] Whereas previously it was only possible to include one single, independent, claim in an application, the revision allowed the inclusion of multiple dependent claims.[85] However, it is clear that this amendment did not substantially alter the number of claims actually included in most patent applications at the time.[86] The reasons for this are manifold, but it is submitted that a significant contributing factor to this observation is the fact that the revision was primarily motivated by Japan's ratification of the Patent Co-operation Treaty[87], i.e. an external rather than an internal factor. This suggests that there was no institutionalised call for more claims therefore, as the single claim system was perceived internally to be working well, there was little need to include more claims in the application. This argument is supported by the fact that the number of patent applications continued to grow year-on-year throughout this period, rather than suffering downturn as broader protection removed the need for a patent clustering protection strategy.[88]

---

[83] Takenaka, *Interpreting Claims*, *op cit.* at 50. Referring to Comments made by Justice Masao Miyake, former Japanese Supreme Court Judge.

[84] Article 36, Law Nº 46, 1975.

[85] See Sakakibara & Bransetter, *op cit.* at 3-4. Also Takenaka, *Interpreting Claims*, *op cit.* at 48, and Kumagai, *op cit.* at 14.

[86] Sakakibara & Bransetter, *ibid.* They provide statistical data gathered by the Japanese Patent Office that shows that until 1987 the average number of claims per patent application across the board was below 1.5, *idem.* at 39.

[87] And therefore its need to comply with the provisions of the Treaty.

[88] See Sakakibara & Bransetter, *op cit.* at 38.

In 1987, following two relatively minor revisions,[89] the law was again amended and the claim system modified to allow multiple independent claims. Furthermore, the ease with which related inventions could be included in a single patent was significantly increased with the new law. It would appear that these revisions had far greater effect on the average number of claims per patent application than any of the previous amendments did. For example, figures from the Japanese Patent Office show a rise from approximately 1.2 to somewhere in the region of 2.5 claims per application between 1987 and 1988 when the reforms were implemented.[90] This is significant for an effective multi-claim patent should (theoretically) enable greater breadth of protection, even under a sub-literal interpretative regime, than a patent consisting of a single claim would allow. This can be seen in figure 1 (below):[91]

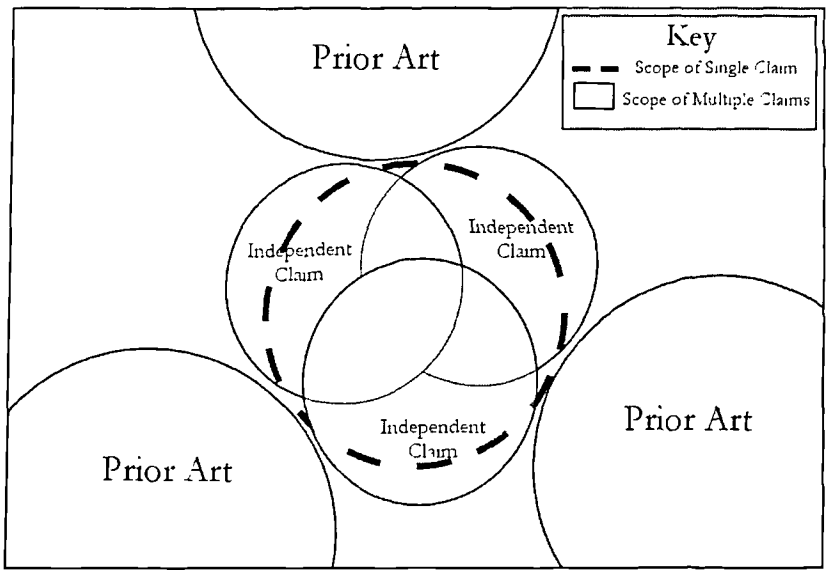

Figure 1: Scope of Single Claim and Multi-Claim Patents

The diagram shows that the use of three relatively narrow independent claims enables the patentee to utilise the space surrounding the inventive core of the application without straying into the prior art more effectively than a single claim would do. Whilst this scope of protection could theoretically have been achieved before the reforms by

[89] One in 1978 (Law № 30, 1978), and one in 1985 (Law №41, 1985).

[90] See Sakakibara & Bransetter, *op cit.* figure 3 on page 39. By 1989, the average number of claims per application was 2.8 – see Japanese Patent Office, *Trends of Industrial Property Right Applications and Registrations*, avaliable online at http://www.jpo.go.jp/shiryou_e/trends_of_ipr.htm. The data set in the latter document spans 1989 to 2001, and shows a year-on-year rise in the number of claims per application.

the filing of multiple applications (as was the common practice), it is clear that the revised system would have significantly reduced the cost of a given level of protection. In addition to this, as Sakakibara & Bransetter note, the multi-claim system may also have improved matters by making it possible for "innovations that could not be completely protected under the old system ... [to] now receive full protection."[92]

Therefore, by implementing measures such as these, the scope of a Japanese patent was manipulated without the need for changes in the established rules of interpretation. It should be noted, however, that the 'take up' of the multiple claim system by Japanese patentees was relatively slim in the first few years of its operation, [93] suggesting that there was a need for an institutional change in working practices in addition to legislative reform.

Policy Reforms

Continued international pressure and criticism, both internal and external, of the narrow scope of protection afforded by the courts' interpretation of Japanese patents finally became too much to ignore. Therefore, in the midst of a decidedly pro-patentee era in Japan – evidenced by the publication of reports such as that of the Council for the Consideration of Intellectual Property in the 21st Century, entitled *Toward the Era of Intellectual Creation*,[94] that details proposals for accelerating the cycle of intellectual creation through intellectual property rights[95] - the Japanese Supreme Court issued what

---

[91] Inspired by a similar diagram in Sakakibara & Bransetter, *op cit.* at 37.

[92] Sakakibara & Bransetter, *op cit.* at 6. For more detail on the ways in which the revisions in 1987 expanded the effective scope of Japanese patents see *idem*, at 8-11.

[93] For example, whereas 91.2% of non-Japanese applicants utilised multiple claims in their applications to the Japanese Patent Office in 1989, only 40.9% of Japanese applicants did so. See Japanese Patent Office, *Trends of Industrial Property Right Applications and Registrations*, *op cit.* figure 1-3.

[94] The full title is *Toward the Era of Intellectual Creation – Challenges for Breakthrough.* Report dated 7th April 1997. A detained outline of this document is available from the Japanese Patent Office website at: http://www.jpo.go.jp/shiryou_e/toushin_e/kenkyukai_e/rep21eng.doc.

[95] A report of the Planning Subcommittee of the Industrial Property Council entitled *To the Better Understanding of Pro-Patent Policy* is rather more blunt in its recitation of policy. This is available online at: http://www.jpo.go.jp/shiryou_e/toushin_e/shingikai_e/report.pdf.

has been described as landmark decision[96] in *Tsubakimoto Seiko v THK KK*[97] (hereinafter the *Ball Spline* decision) and explicitly endorsed the doctrine of equivalents.[98]

As noted, the Japanese system in the pre-equivalents era was heavily biased towards protection of the interests of society over and above the interests of any individual patentee. The policy in the early years of the system was geared towards technological growth, to reduce the yawning gap between Japan and the advanced Western nations on which it modelled its renovation. Improvement and advancement were the watchwords, and therefore individual success was less important than the success of the collective. Technology advanced by assimilation and there was no room for the uncertainties that extending protection into the area beyond the literal scope of the claims would allow. Indeed, as Takenaka notes, "the Japanese Courts refused to introduce an unclear concept of equivalents into their patent system," resulting in a patentee's claim for infringement by equivalents to often be viewed as an admission of no infringement.[99] It was only in 'exceptional' cases, with the aim of preventing a manifestly unfair result, that any protection beyond the textual meaning was achieved, and even in such circumstances this was facilitated by manipulation of the literal meaning under what was known as the 'substantial identity rule'.[100] Explicit recognition of the doctrine of equivalents by the Japanese supreme judicial body is therefore of considerable importance in the evolution of the intellectual property system there.

---

[96] By Yamamoto & Tessensohn, *Doctrine of Equivalents adds Torque to Japanese Patent Infringement*, (1999) 81 JPTOS 483 (hereinafter Yamamoto & Tessensohn, *Torque*) at 483.

[97] 1630 Hanrei Jiho 32 (Supreme Court, 1998).

[98] Discussions of the *Ball Spline* decision are many, and include Takenaka, *The Doctrine of Equivalents in Japan*, (2000) 6 CASRIP Symposium Publication Series 125 at 125-6. Available online at: http://www.law.washington.edu/casrip/Symposium/Number6/Takenaka.pdf. Also see Tani, *THK Co. v Tsubakimoto Seiko Co. – Infringement Case for Ball Spline Bearing*, (1998) 1(6) Journal of World Intellectual Property 963. Kim, *A Comparative Analysis of the Japanese Supreme Court Decision on Doctrine of Equivalents*, [2002] IPQ 18. Sonoda & Kobayashi, *Doctrine of Equivalents in Japan*, available online at: http://www.patents.jp/Doctrine%20o82o81o82o86o20Equivalents%20Supreme%20Court.pdf. Also Yamamoto & Tessensohn, *Torque*, *op cit.*

[99] Takenaka, *The Doctrine of Equivalents in Japan*, *op cit.* at 125-6.

[100] Somewhat similar to the old British approach utilised to avoid results that would rob the patentee of all protection, evidenced by cases such as *Henriksen v Tallon* [1965] RPC 434.

The *Ball Spline* Decision

The report issued in 1997 by the Council for the Consideration of Intellectual Property in the 21st Century, *Toward the Era of Intellectual Creation – Challenges for Breakthrough*, called for a paradigm shift in Japan's intellectual property system in order to adequately protect the 'fruits of research and development' labour. During the previous ten years the explosive technological growth witnessed in the early and mid-1980s had slowed, and competition within the high-tech industries intensified in consequence. This increase in competition can be seen to have spilled over into the realm of litigation as the number of patent cases filed before Japanese courts rose by a staggering 66% between 1994 and 1998.[101] It was therefore in highly litigious climate, with the added pressure of pro-patent policy considerations, that the shift of interpretation in favour of the patentee finally occurred.

The decision in case Nº Heisei (O) 1083, *Tsubakimoto Seiko v THK KK* (the *Ball Spline* decision) had been eagerly awaited by both the Japanese and international patent communities. In an earlier decision, the Osaka High Court (a very influential appellate court in Japan) had wholeheartedly endorsed the application of the doctrine of equivalents in a clear-cut case of attempted evasion of Genentech's t-PA clot busting drug patent.[102] The decision in this case was described at the time as being "epoch-making"[103]; it was therefore considered to be only a matter of time before the Supreme Court was called in to conclusively rule on the issue. The chance came in *Ball Spline.*

The Patent

The case concerned a patent for an "endlessly sliding ball spline bearing" (constituent element E) comprising four sub-elements A to D. The defendant's product satisfied elements C, D and E, but differed from the claimed product in the following manner.

---

[101] See Yamamoto & Tessensohn, *Broadly, Correctly and Openly – Japanese Patent Litigation as a Weapon for the 21st Century*, in Yamamoto (ed) *20/20 for the 21st Century: 1979-1999: A Special Twentieth Anniversary Issue of IP Japan*, (1999; Yamamoto Patent Law Offices, Osaka), (hereinafter Yamamoto, *20/20*) 242 at 243. This increase in litigation may, to a certain extent be a knock-on effect of the expansion of the scope of protection given by the introduction of the multiple claim system with the 1988 reforms.

[102] For a detailed discussion of the case (*Genentech Inc. v Sumitomo Pharmaceutical Co. Ltd.* H-6 (ne) Nº 3292 (29th March, 1996)) see Yamamoto & Tessensohn, *The Born-Again Doctrine of Equivalents in Japan: The Genentech Appeal [1996] EIPR 572.* (Hereinafter Yamamoto & Tessensohn, *Born-Again*)

[103] See Yamamoto & Tessensohn, *Born-Again, ibid.* at 578.

In regard to element A, the patent called for "an outer cylinder having torque transmitting load-bearing ball-guiding grooves with a U-shaped cross-section, ... the outer cylinder having an annular circumferentially directed groove [in portion 7]..."[104] The Defendant's product differed in that it was of "semicircular cross section" and had a "cylindrical portion 7"[105] The patent claimed element B as a retainer that functioned as a guide for the balls in their continuous circulation, to retain the balls when the spline shaft was removed, and as a guide for the ribbed portions of the spline shaft. In the defendant's product these functions were effected by the co-operation of three separate members.[106]

The Original Decision

The Tokyo District Court had determined that there was infringement as, despite its differences, the defendant's product was held to fall within the technical scope of the invention for the following reasons: First, the two products were substantially the same in respect of "the solution for solving the technical problem, the basic technical idea, and the effects obtained by the constituent features."[107] Second, with regard to the structure of the retainer (constituting element B), there was "recognized interchangeability between the present invention and the appellant's product and ease of interchangeability at the time of filing."[108] Finally, concerning the differences in element A between the two products, there was no special technological significance that could be attributed to the substitution of a "semicircular cross section" for a "U-shaped cross section", or to the difference between a "circumferentially directed groove" and the "cylindrical portion 7".

The Appeal

On appeal, the Supreme Court was not content to uphold the decision of the Tokyo Court on the reasoning given above. Rather it proceeded to take the opportunity to

---

[104] Taken from a translation of the claim reproduced in Tani, *op cit.* at 966.

[105] The reader may note the similarity in these differences (if that is not a tautology) with the English case of *Rodi & Wienenberger v Showell, [1969] RPC 367.*

[106] For a full translation and reproduction of the claim and discussion of the defendant's product see Tani, *op cit.* at 966.

[107] Paragraph 2.4 of the translation of the decision of the Supreme Court in *Ball Spline* annexed to Tani, *op cit.* at 980. All subsequent references to the translation of the case are to this version.

[108] *Ibid.*

clearly explain the "policy justification for finding infringement under the doctrine of equivalents, and clarified the appropriate test for applying" it.[109]

The court began by referring to Article 70 of the 1959 Patent Ordinance and stated that the technical scope of the patented invention must be determined by reference to the claims in the specification. "If there are elements that differ between the constitution described in a patented claim and corresponding product and the like, the corresponding product cannot be said to fall within the technical scope of the patented invention."[110] However, it continued stating that even if there were elements that differed between the patent claims and the accused infringement, the latter may be said to be equivalent to the constitution described in the claim, and may be said to fall within the technical scope of the patented invention, as long as certain criteria were satisfied. *Viz.*:

> " (1) that the differing elements are not the essential elements in the patented invention;
> (2) even if the differing elements are interchanged by elements of the corresponding product and the like, the object of the patented invention can be achieved and the same effects can be obtained;
> (3) by interchanging as above, a person of ordinary skill in the art to which the invention pertains (hereinafter referred to as an artisan) could have easily achieved the corresponding product and the like at the time of manufacture etc. of the corresponding product;
> (4) the corresponding product and the like are not the same as the known art at the time of application for [the] patent or could not have been easily conceived by an artisan at the time of application for [the] patent; and
> (5) there [are] not any special circumstances such that the corresponding product and the like are intentionally excluded form the scope of the claim during patent prosecution."[111]

In sanctioning a departure from the exact wording of the claims, the Court noted the difficulty of writing a specification that took into account all future modes of infringement at the outset. In addition, it said that the value of a patent in encouraging innovation would be greatly diminished if another party could easily circumvent its protection by replacing part of the composition with techniques or materials that became available after the filing date. Such restriction on the rights of the patentee

---

[109] See Yamamoto & Tessensohn, *Torque, op cit.* at 483.

[110] See paragraph 3.1 of the translation of the decision of the Supreme Court in *Ball Spline.*

[111] Hereinafter referred to as the test. Paragraphs 3.1.1 to 3.1.5 of the translation of the decision of the Supreme Court in *Ball Spline.* It should be noted that (1) to (3) are the positive requirements for invocation of the doctrine and that (4) and (5) are restrictions on the scope of the doctrine. See further below.

would not only violate the "purpose of patent law to contribute to the development of industries through protection of and encouragement of invention, but [would also deny]... social justice, resulting in the breach of the concept of equity."[112]

The Court considered that it should therefore be understood that the substantive value of a patented invention should extend from the claims to cover equivalents that would be obvious to a third party and which are substantially identical to the constitution described in the claims. Conversely, protection would not extend to technology that was known at the time of filing the patent, or which would have been obvious to those skilled in the art at the filing date. Furthermore, where the patentee has intentionally excluded technology from the scope of the claims (e.g. during prosecution), or has committed an act that can be outwardly interpreted as doing so, she will be estopped from making contrary assertions at a later date.[113]

The Court then considered the merits of the case and concluded that despite the defendant's variants being inessential, having no material effect on the way the invention worked or the result obtained, and being obvious substitutes for the elements in the patentee's invention[114] there was, nonetheless, no infringement. The reason for this finding lay in the final (negative) requirements for the invocation of the doctrine of equivalents, specifically requirement (4) – that the accused embodiment is not the same as the known art at the time of application for the patent nor could have been easily conceived by one skilled in the art at this time. The Court found that the accused embodiment could have easily been arrived at without the teaching of the patented invention and was therefore not equivalent to the claimed invention.[115] This finding is in itself important, as the defendant's device in this instance was a patented invention.[116] Therefore, by its finding that the device did not infringe by reason of being within the prior art, the Supreme Court effectively invalidated the patent despite not having the jurisdiction to do so explicitly.

---

[112] Paragraph 3.1 of the decision of the Supreme Court in *Ball Spline*.

[113] Paraphrased version of the remainder of paragraph 3.1 of the decision of the Supreme Court in *Ball Spline*.

[114] i.e. fulfilling elements (1) to (3) of the test for invoking the doctrine of equivalents.

[115] See paragraph 3.2 of the decision of the Supreme Court in *Ball Spline*.

[116] Japanese patent № 1611468.

The Repercussions and the Fallout

On a superficial examination, the repercussions from the case appear to be mainly positive for the patentee. For example, the Court stated that the proper viewpoint from which to view the claim language was that of a person with ordinary skill in the art. This put an end to the Court's previous practice of interpreting the language of the claims from their own (i.e. the judge's) viewpoint. The restrictions previously placed on claim scope by viewing the examples disclosed in the specification as limiting the monopoly were now superseded by instruction to view them for what they were: examples. The use of extrinsic evidence in the form of technical experts and the shift in focus to the *claim* language[117] in the interpretation of the patent also facilitated "an expansion of the literal infringement scope."[118] Furthermore, explicit recognition of the existence of the doctrine of equivalents has meant that the prevalence of cases in which it is pleaded has seen a dramatic increase.[119] As already noted, the fear before *Ball Spline* was that alleging infringement by equivalents was tantamount to an admission of no literal infringement. However, the Supreme Court not only made clear that the doctrine supplemented the literal scope of a patent but, furthermore, provided a test that must be applied before infringement by equivalents could be ruled out, thus forcing lower courts to consider both tests.

However, whilst the decision in *Ball Spline* is undoubtedly very important in its establishment and provision of clear rules for the application of the doctrine of equivalents in Japanese patent law, this is not its only value. In one sense, the decision clearly marks a departure from the previous restrictive attitude of the Japanese courts, but in another it can be seen as the perfect illustration of this restriction. The reason for this lies, primarily, in the application of the test laid down by the Court, specifically its concentration on the restrictive elements. The inclusion of the prior art defence, and the attendant standard of the *ordinary* person skilled in the art is particularly important as this condition potentially imposes a broader conception that that of the skilled addressee *per se*.[120] Therefore, although the Supreme Court can be seen to have followed the German model of the state-of-art defence established and applied in its

---

[117] Rather than the language of the specification as a whole.

[118] See Takenaka, *The Doctrine of Equivalents in Japan, op cit.* at 127

[119] *Ibid.*

[120] Indeed, as will be seen, later decisions have transformed the potential into the actual.

expanded form in *Formstein*,[121] its exact scope was unclear, based, as it was, on the muddy concept of what is *ordinary*.

Subsequent interpretation

Subsequent cases have demonstrated the "Japanese court's reluctance to apply the doctrine of equivalents"[122] by reliance on restrictive interpretations of the positive factors, in particular the demonstrable confusion that has arisen over what exactly characterises a non-essential element of the invention.[123] The decisions that directly followed *Ball Spline* struggled to come to terms with the sudden change of direction and degree of ambiguity that it left in its wake. A small number are worthy of note:

In *SS Seiyaku v Zensei Yakuhin KK*,[124] the Osaka District Court considered the meaning of the phrase 'essential elements of the invention', and stated that these must be understood as being the "fundamental technical features which produce the results particular to the invention".[125] As such, they are the elements which, if replaced, would result in a technical idea different to that of the patented invention. By adopting this definition, the Court effectively elides the first two questions of the test and, additionally, provides interpretative freedom in the determination of when such an element will "produce effects *particular* to the invention" that are not contributed by prior teaching. Indeed, it is clear that almost any element can be seen to produce effects particular to an invention and therefore be deemed to be essential[126] – therefore precluding the application of the doctrine of equivalents. In *SS Seiyaku*, the Court

---

[121] *(1987) 18 IIC 795* with comments by Geissler. Also *[1991] RPC 597*.

[122] See Yamamoto & Tessensohn, *The Evolution of the Doctrine of Equivalents in Recent Japanese Patent Litigation*, in Yamamoto, *20/20*, 276 at 280.

[123] The first requirement of the *Ball Spline* test.

[124] Heisei 8 (wa) 8927, a decision of the Osaka District Court (17th September 1998).

[125] Quoted from the translation of the decision in Sonoda & Kobayashi, *Doctrine of Equivalents in Japan after the Supreme Court Decision in 1998 on the Ball Spline Bearing Case*, (October, 1999). Available online at: www.patents.gr.jp/Doctrine%20of%20Equivalents%20after%20Ball%20Spline%20Case.pdf.

[126] For parity of reasoning see, for example, majority's judgment in the House of Lords' decision in *Van der Lely v Bamfords*, *[1963] RPC 61* whereby the patentee, by specifying 'hindmost wheels' mountable in line with the foremost wheels in his patent, precluded infringement by a competitor's machine wherein the foremost wheels were mountable in line with the hindmost. Applying the test set out above, it can be seen that the specification of hindmost wheels mountable in line with the foremost wheels produces an effect that is *particular* to that invention, therefore making this an essential element.

considered that the element for which the defendant had provided a substitute was indeed essential, and therefore declined to find infringement. Further, considering the non-obviousness of the substitution, it concluded that the third test for the invocation of the doctrine of equivalents was also not satisfied.[127]

Another decision that is of interest is that of the Tokyo District Court in *KK Kouken v KK Tatsumi Ryouki.*[128] The case concerned an invention for a water resistant load system that comprised of a cylindrical main electrode and a hollow cylindrical base electrode. The base electrode was insulated and the patent required the main electrode to pass through the bottom of this element. In the alleged infringement, the main electrode was modified so that it did not pass through the base electrode, but was rather spaced apart from it.[129] It was accepted that this produced a risk of electrical short-circuit being created via the water.

The Court began by explaining that the basis for the doctrine of equivalents was found in the court's ability to give recognition to substance over precise form. In the same way that the court could recognise a relationship between a man and a woman who had not registered their marriage but were in substance a married couple, so it could recognise infringement where the accused and the patented devices were, in substance, the same. This ability under the general law enabled the court to avoid unfair results that would be produced by strict enforcement of formality requirements. Having rationalised the application of the doctrine in this way, the court then proceeded to apply the criteria laid down by the Supreme Court in *Ball Spline.* In doing so it allocated the burden of proof for the first three stages of the test (the positive criteria) to the patentee, and the latter two (the negative criteria) to the defendant.[130]

---

[127] i.e. that the person of ordinary skill in the art would not have perceived the substitution as obvious, and therefore there could be no infringement.

[128] Hanrei Jiho Nº 1657, 122 (1999) a decision of the Tokyo District Court (7th October, 1998).

[129] The summary of the case that appears in the next few paragraphs is largely based on that found in Yamamoto & Tessensohn, *The Evolution of the Doctrine of Equivalents in Recent Japanese Patent Litigation, op cit.* at 283-6. See also Takenaka, *The Doctrine of Equivalents after the Supreme Court "Ball Spline" Decision. (1999) 5(4) CASRIP 6.* Available online at:
http://www.law.washington.edu/Casrip/newsletter/newsv5i4jp1.htm.

[130] In contrast to the U.S. position, whereby the burden is placed on the patentee once the prosecution history has been raised.

Regarding the first and second conditions, i.e. that the difference must be in an inessential element of the invention and that the modification must not alter the function and result of the patented invention, the Court found that the defendant's machine was substantially the same as the patentee's invention. However, it was on the interpretation of the third leg of the test – that the variants adopted by the defendant should have been readily understood by *everyone in the field of the invention* to be substitutes for those detailed in the patent – that the possibility of infringement by equivalents floundered. The Court considered that the risk of electrical short-circuit in the defendant's product was sufficient to dissuade many in the field from adopting the variant, thus it was not readily conceived by everyone in the field, and was consequently not equivalent to the patentee's invention.[131]

The adoption of such a standard is most significant, as it renders the degree of obviousness for the replacement of features between the patented device and the accused infringement at a much higher level than the corresponding test for inventive step.[132] Therefore the protection provided by the patent under an equivalents analysis does not accurately correspond to the degree of 'dead flesh' that the grant creates around any given innovation, and furthermore does not correspond to the Supreme Court's policy justification of the doctrine of equivalents in *Ball Spline.*[133] As such, the establishment of a strict standard enables the courts to provide narrow protection, denying the application of the doctrine of equivalents to all but the most obvious modifications – i.e. those cases in which a literal interpretation of the claims would produce an unfair result; startlingly similar to the pre-*Ball Spline* position.

Having denied infringement by equivalents in this way the Court obviated the need to enter into the treacherous area surrounding the issue of file wrapper estoppel, in which virtually the whole of the defendant's arguments had been based. Therefore, at the same time as the courts in the U.S. were limiting the effect of the doctrine of

---

[131] Although this does seem to be precipitously close to saying that an infringement done badly is not an infringement.

[132] The test for the inventive step being defined in the Patent Ordinance as "would not readily have been conceived by one skilled in the art". See Article 29(2).

[133] See text accompanying notes 105 *et seq.* above.

equivalents by (over) reliance on the prosecution history,[134] the Japanese courts were developing their own limitations based on other elements of the test. Foremost in this exercise was the continued tension over what exactly characterised an essential element of the invention. A review of decisions immediately following *Ball Spline* reveals that the courts most frequently rely upon the "essential element" test when rejecting the patentee's request to invoke the doctrine of equivalents.[135]

One such example of this approach is the decision in *SS Seiyaku*, discussed above; another is the judgment of the Tokyo District Court in *Shinwa Seisakusho v Furuta Denki KK*.[136] The latter was the first since the recognition of the existence of the doctrine in *Ball Spline* in which the claim of infringement by equivalents was upheld. It concerned apparatus for separating seaweed from other matter in seawater, and the decision hinged on the definition of "essential element". The Court considered that this phrase should be interpreted as meaning the technical features that give a basis for solving the problem unique to the patented invention.[137] However, the judgment is less important for the exact formulation of the test than for the clarification of the policy justifications behind adopting the definition. The Court stated that:

> "The patent system attempts to protect the essential value of the invention, that is the disclosure of the technical idea which has not been existed in the prior art and results in a solution of a technical object that has never been attained by the prior art. Accordingly, the essential part should be understood to comprise the technical features, which relate to the core of the technical idea underlying the solution of the technical object unique to the patented invention... Because the patented invention results in a function and result unique to that invention through a physical combination of technical features, in determining whether the difference in technical features of the accused device relates to an essential part, a court's analysis should not simply focus on the technical feature that is removed from the rest of features recited in the disputed claim. Instead courts should examine the prior art and identify the characteristic principle underlying the solution of the technical object unique to the patented invention. They should then examine whether the principle underlying the solution of the accused product is substantially the same as the identified principle of the patented invention."[138] *(sic)*

---

[134] For more information see text accompanying note 123 *et seq.* in Chapter VI, above.

[135] See Takenaka, *The Essential Element Test Provides a big Hurdle to Japanese Doctrine of Equivalents*, (2000) 7(2) CASRIP, (Hereinafter Takenaka, *Essential Element*). Available online at: http://www.law.washington.edu/casrip/newsletter/newsv7i2jp4.pdf.

[136] Decision of the Tokyo District Court dated 23rd March 2000.

[137] See Takenaka, *Essential Element, op cit.*

[138] Reproduced in Takenaka, *Essential Element, ibid.*

Therefore, under this analysis, whether an element is essential or not depends on the view that is taken of the prior art, i.e. the path by which the invention may have come about. This can be seen as a variation of the problem-solution approach undertaken by the European Patent Office when determining inventive step,[139] and suffers from the same problems – in that the perception will vary with the choice of prior art. Hence, where there are two equally close prior disclosures that concern different elements it may be difficult to decide which, if either, to use to determine the essence of the invention. After all, any element added to distinguish from one or the other piece of prior art may be seen to be essential and thus not variable.

Additionally, Takenaka suggests that the adoption of this test will contradict the "well-accepted notion of a greater scope of equivalents for pioneer inventions and important improvements than for minor improvements."[140] This is because the greater the gap between the prior art references and the patented invention, the more likely the elements are to be seen as essential – given that they form the basis for solving the problem unique to the patented invention. The potential for a wide range of equivalents will, therefore, be most marked in inventions resulting from a combination of known features, as here all of the elements already exist in the prior art, and cannot be seen as being essential.

This is a critical distinction, as the introduction of the doctrine of equivalents into Japanese law was, to a certain degree, prompted by Japan's desire to move from a net imitator to net producer of technology: To enter the "era of intellectual creation". It will be recalled that the pre-equivalents Japanese system had been widely criticised as promoting incremental rather than pioneer innovation. The pioneer invention entails the greatest risk on the part of the innovator; it has an uncertain benefit/cost ratio and is therefore the invention that benefits most (in terms of increasing the probability of

---

[139] Evident in cases such as *Bayer/Carbonless Copying T1/80 [1979-85] B EPOR 250*. Although this is not to say that this was ever intended as such by the Japanese Court.

[140] Takenaka, *The Doctrine of Equivalents in Japan*, *op cit.* at 131-2. The reader will appreciate that whilst it may be a "well accepted notion" that pioneer inventions should receive broader protection, it is by no means universally accepted. See, for example, Merges & Nelson's 'race to invent theory' described in their 1990 Colombia Law Review article *On the Complex Economics of Patent Scope*, *(1990) 90 Colombia Law Review 839*. See further text accompanying note 101, *et seq.* in Chapter V, above.

production) from patent protection.[141] The *Ball Spline* decision was hailed as an epoch in Japanese claim interpretation, casting off the restrictive burden of the previous narrow practice. Yet the requirements and limitations placed on the operation of the doctrine of equivalents under *Ball Spline* (as interpreted) once more favour the incremental over the pioneer invention.[142]

Conclusion

Despite explicit recognition of the doctrine of equivalents in Japanese patent law with the decision in *Ball Spline*, the subsequent ambiguity and narrow approach of the lower courts when considering the scope of the five-stage test has somewhat lessened its impact. However, the very fact that it was introduced at all is significant as it marks a conscious decision by the Supreme Court to move from a net importer of technology to an "era of intellectual creation".

However, the question that now arises is whether the changes were actually required to make this transition, or whether, as the cynic may suggest, they were implemented in order to fit in with an increasingly Americanised market? Let us examine the evidence:

In pre-*Ball Spline* Japan the patent grant still managed to push forward technology, however, it did not do this by the grant of enticing broad monopoly grants designed to reward only the first to innovate in any given area. It pushed the technological boundaries by providing a structure in which invention and innovation could be traded. Inventing became not so much a practice of quantum leaps, but rather one of continual refinement. Business practices, specifically the patent trade that accompanied the development of technology, avoided the need to go to court and therefore avoided the need for wide grants. A complex trading game,[143] whereby corporations would pay royalties and negotiate licences based on the number of patents that they have, operated in a connected sphere and emphasises that factors other than broad scope can be

---

[141] This analysis is based on Scherer's categorisation of invention that can be found in his highly influential study, *Industrial Market Structure and Economic Performance*, (1980; Houghton Mifflin, Boston; 2nd Ed.) at 443-50. See text accompanying notes 42-46 in Chapter V, above.

[142] The reader may note that the approach taken by the English Court of Appeal *in Kirin-Amgen Inc. v Transkaryotic Therapies Inc.*, [2003] RPC 31 also seems to limit the interpretation placed on the patent claims in 'fast moving' technologies (where pioneer inventions are generally to be found).

[143] "Pokemon" anyone?

utilised to manipulate and control inventive activity. The Japanese experience proves that it is a fallacy to conclude that patents are just important for the protection that they offer. They are also important, as has been noted,[144] for the very fact that they are patents. Therefore, does the interpretation that is given to the claims actually matter as long as it is consistent? As has been shown, there is a strong argument that can be made for very narrow interpretation, akin to that available in pre-*Ball Spline* Japan, in order to spur on the refinements in technology that form a broad basis for future leaps. No 'equivalents' protection, indeed no broad protection of any kind, is required to fulfil this aim provided the position is clear and industry can react.

The traditional Japanese patent system (i.e. that before *Ball Spline*) actually incorporated a device that can be seen to operate in the same manner as the U.S. style doctrine of equivalents albeit by radically different means. By limiting the scope of the patent to that actually embodied in the specification as a whole, with the claims limited as necessary by the description and drawings, the Japanese system simply made the extension to cover equivalents unnecessary. It was the market as a whole that dictated the equivalents protection, and the patent system protected these by the grant of additional patents. Admittedly this protection was not complete, but the adoption of different standards for the assessment of inventive step and the assessment of when a variant will be obvious enough to be considered an equivalent leaves much the same gap in protection even post-*Ball Spine*. In the pre-equivalents days, as the narrow position was well known to all that were involved in the process of innovation, it was unnecessary to extend the scope of protection to enable any one patent to cover the ground that the mass could cover. The research and development spending was structured in such a manner as to avoid the complications that could have arisen. The answer to narrow protection was not, nor could it ever have been, litigation: The answer was the development of business strategies, including simple bargaining between companies, which augmented the patent system and served to qualify its perceived limitations. In such a model, the only people not benefiting were those unfamiliar with the customs or unwilling to play the game. It is therefore no coincidence that these parties were the very ones pushing for reform to a fairer[145] 'international' standard.

---

[144] See Chapter IV, above.

[145] i.e. more familiar, Westernised.

The question that then arises is whether the world system, as we see it, needs disparity between nations, with some giving broad protection and others giving narrow protection, in order that the spectrum of innovative activity can be maintained? If this is the case then the push towards a world standard of intellectual property protection[146] may actually do more damage than good. Japan's story vividly demonstrates the difficulty of technological evolution in an increasingly international world. The meteoric rise from feudal surf to technological whiz-kid that the country has undergone in less than 150 years is little short of astounding, and poses the question of whether it could be repeated today. The homogenisation of Patent Law, the claim implicit in TRIPS that one size can, and indeed should, fit all, does not adequately correspond with the picture of Japan's evolution. If Sakakibara & Branstetter's conclusion that the Patent Law reforms of 1988 did not have an appreciable effect on the level of innovative activity in Japan, despite objectively broadening the potential scope of the claimed invention,[147] then the American premise that stronger is better seems to be misplaced. The object of any patent law cannot be the satisfaction of international interests over and above protection/ stimulation of national ones, and yet this is what TRIPS demands.

If, as the Japanese experience suggests, narrow protection does not necessarily equate to slow progress, and moreover broadening protection does not automatically lead to an increase in innovation, then, as Sakakibara & Branstetter conclude, "some of these theoretical models and the "pro-patent" public policies based on them will need to be reexamined." [148] Indeed.

---

[146] As evidenced by international treaties such as TRIPS

[147] Sakakibara & Branstetter, *op cit.* at 31.

[148] *Ibid.* at 32.

CHAPTER IX

In Conclusion: Britain

Introduction: *Catnic*

The current law on the interpretation of patent claims in the U.K. shares its origins with that of Germany. Both are based on Article 69 of the European Patent Convention ('the EPC') and the Protocol on the Interpretation thereof ('the Protocol'). The reader will recall that the former decrees that "the extent of protection conferred by a European patent ... shall be determined by the terms of the claims," and that the description and the drawings are to assist in their interpretation. The latter stresses that a middle ground should be taken between using the claims merely as guidelines and determining protection based on their literal wording alone, thus combining a "fair protection for the patentee with a reasonable degree of certainty for third parties."[1] These provisions are incorporated into British law by s.125 of the Patents Act 1977 ('the 1977 Act'). This section is "so framed as to have, as nearly as practicable, the same effects in the United Kingdom as the corresponding provisions of the European Patent Convention."[2]

The case that is generally (although by no means universally, or always enthusiastically) accepted as forming the starting point under the 'new' law is *Catnic Components v Hill & Smith.*[3] Despite being decided in the context of a 1949 Act patent, the *Catnic* test (as reformulated in subsequent decisions) has become the mainstay of the British approach to claim interpretation under the 1977 Act. For current purposes it is important to note that Lord Diplock's famous judgment in the case shifted emphasis from the erstwhile restrictive approach of the courts, evidenced by decisions such as *Van der Lely v Bamfords* and *Rodi & Wienenberger v Showell*,[4] towards the new Jerusalem of 'purposive construction'.

The Test

The case concerned a patent for a steel lintel in which the claims specified that the back-plate should extend "vertically" from the floor-plate. Lord Diplock began his discussion of infringement by considering the nature of the specification. This, he said, could be characterised as:

---

[1] See further, the opening paragraphs in Chapter VII, above.

[2] Section 130(7) Patents Act 1977.

[3] *[1982] RPC 183*

[4] Discussed in Chapter I, above.

> "... [A] unilateral statement by the patentee, in words of his own choosing, addressed to those likely to have a practical interest in the subject matter of his invention ... by which he informs them what he claims to be the essential features of the new product or process for which the letters patent grant him a monopoly."[5]

He then continued, stressing that there were no separate questions of 'textual' and 'non-textual' infringement:[6] simply put, there is "but a single cause of action". Therefore, the:

> "... specification should be given a purposive construction rather than a purely literal one derived from applying to it the kind of meticulous verbal analysis in which lawyers are too often tempted by their training to indulge."[7]

Lord Diplock then laid down what has become the classic test for the interpretation of the claims of a patent in the U.K.

> "The essential question in each case is: whether persons with practical knowledge and experience of the kind of work in which the invention was intended to be used, would understand that strict compliance with a particular descriptive word or phrase appearing in a claim was intended by the patentee to be an essential requirement of the invention so that *any* variant would fall outside of the monopoly claimed, even though it could have no material effect on the way the invention worked..."[8]

He continued, stating that this question is only to be answered in the negative:

> "... when it would be apparent to any reader skilled in the art that a particular descriptive word or phrase used in a claim *cannot have been intended* by a patentee, who was also skilled in the art, to *exclude minor variants* which, to the knowledge of both him and the readers to whom the patent was addressed, could have no material effect on the way in which the invention worked."[9] (emphasis supplied)

The Problems

Lord Diplock's choice of words here is revealing. By restricting protection to those cases in which the skilled addressee believes that the patentee *cannot* have intended strict compliance, his Lordship illustrates a very traditional approach to claim construction whilst explicitly claiming otherwise. The grant is viewed from the point of view of public certainty, just as in *Van der Lely* and its ilk, and the message that is communicated is that the patentee must have intended strict compliance unless this results in a

---

[5] Per Lord Diplock, in *Catnic*, *[1982] RPC 183*, at 242-3.

[6] As was the position under the 'pith and marrow' test discussed in Chapter I, above.

[7] *Ibid.*

[8] *Ibid.* at 243.

[9] *Ibid.*

manifestly wrong result. Indeed, if we apply the *Catnic* test to the facts of the aforementioned 'hay rake' case then we see the same outcome – the skilled addressee would be entitled to think that the patentee had some reason for restricting their claim to dismountable 'hindmost wheels' so that any variant falls outside of the scope of protection.

Lord Diplock's application of the test also illustrates its sensitivity to the identity of the skilled addressee. In *Catnic* his Lordship describes the patented technology, a steel lintel, as "simple". Furthermore, he considered that the addressee in this case, identified as being a builder rather than a geometer, would have understood the adverb "vertically" in the claims to mean "near enough to the exact geometrical vertical to enable it in actual use to perform satisfactorily all of the functions that it could perform if it were precisely vertical".[10] Taken in the light of the preceding Chapters, this formulation is most significant. The actual result of the case is strongly reminiscent of the approach of the Court in *Henriksen v Tallon*,[11] in that the patent is interpreted so as not to rob the patentee of all protection. However, rather than basing the decision on broad policy arguments, it is the level at which the patent is addressed that is conclusive as it has a marked impact on the degree of latitude with which it is to be interpreted.

The fact that it was "simple" technology seems to have influenced His Lordship's conclusion that the patentee could not have intended to limit their claim to the 'literal' definition of vertical; understood by structural engineers everywhere to mean 90° to the horizontal. The choice of the skilled addressee in this case is intriguing. Lord Diplock considers that the specification is addressed to those using the invention – i.e. the consumer – rather than the person interested in performing it, or in creating the inventive product. Setting the standard of the relevant teaching at such a low level enables the decision, which may be seen as being a fair one on the facts of the case, to be made without delving into a detailed examination of the justifications for making the apparent departure from existing practice. However, it does render the subsequent application of the *Catnic* question rather surreal.

---

[10] *Ibid.* at 244.

[11] *[1965] RPC 434*. Discussed at notes 23 to 26 in Chapter I, above.

A problem occurs because Lord Diplock's choice of a consumer, someone with "practical knowledge and experience of the kind of work in which the invention was intended to be used," as the focus of the investigation necessarily expands the emphasis of the patent. This conclusion is apposite as they, unversed with the intricacies of the law, should see no reason for the patentee to restrict the claim's scope to a literal interpretation of the words used where this would rob them of all protection in any given situation. Therefore, in order to answer the question, the skilled addressee would need to be informed of the function of the claims in the patent. As Turner notes, their answer would then depend on what they were told. If, for example, they had been schooled in the British approach and informed that the claims define the outer boundary of protection then a narrower interpretation would be forthcoming than if the addressee had been told that they simply identified the principal features of the invention.[12]

Furthermore, Lord Diplock's fiction of intent does not correspond to commercial reality, for it is anomalous to assume that the patentee has restricted themselves to a literal interpretation of their claims unless this *cannot* have been their intention. If the patentee had thought of the variant then the patent would have been drafted in such a manner that it fell within its literal scope. The fact that it does not must necessarily mean that it did not occur to them. Therefore, whilst there is an argument that the scope of protection should be limited to that explicitly asked for, and thereby claimed in the patent, it is absurd to infer intention from the fact that a variant did not cross the patentee's mind. Lord Diplock's formulation also assumes that it is the patentee – i.e. the inventor, probably a scientist or engineer not versed in the pedantry of the law – who actually drafts the patent in the first place: this is rarely the case.

When the reality is considered, therefore, this fiction of intent is fatally flawed on two grounds. First, by virtue of the fact that the patentee would never intend to restrict their protection in the manner contemplated by His Lordship. Second because it is not generally the patentee, a person traditionally perceived to be ill at ease with semantic gymnastics, which drafts the patent in the first place. It will be noted that the pressures that these considerations place upon the direction of the investigation may be argued to

---

[12] Turner, *Purposive Construction - Seven Reasons why Catnic is Wrong*, [1999] CIPAJ 700 (hereinafter, Turner, *Seven Reasons*) at 700-1.

be equal and opposite. Therefore, the fact that the patentee would not choose to limit their protection finds mitigation in the fact that they employ, or can employ, a third party in the drafting process. It is clear that patentees are free to draft their patent documents themselves, however they are then at a disadvantage compared to those engaging the services of a seasoned professional. However, even if this view is taken, it is a significant step to then assume that just because a particular variant is not included in a claim the person drafting it must have intended to exclude it.

This point is important as it exposes the some of the tensions in the *Catnic* decision itself, and additionally highlights the fact that if a patent attorney, rather than a patentee, drafts the claims then one eye will certainly be focused on preventing 'designing around' the invention.[13] Therefore, it could be argued that it would be better to explicitly recognise, for the purposes of infringement at least, that the claims are directed to those with a practical interest in interpreting or drafting them. If this is the case then there is a far stronger argument to be made for a narrow interpretation. Yet this line of reasoning is fundamentally flawed as it reverts to a literal interpretation of the claims; a result explicitly prohibited by the Protocol. The better view, therefore, would be to maintain the current *Catnic* formulation but to require the assessment of scope to be made on the date at which the claims are being designed around, i.e. the date of infringement. Requiring an interpretation to be made at this point would marry construction with the information functions of the patent and, in the opinion of this author at least, would *provide a more rational basis for the protection of invention.* This would also help to tie the provisions of patentability and infringement in a much more satisfactory manner, as the question of what the patent teaches the skilled addressee is then reflected in the protection that it is to enjoy at the date of infringement.

However, it is in relation to this point that we find possibly the most important restriction in Lord Diplock's assessment, for his Lordship states that the *Catnic* question does not arise "unless at the *date of publication of the specification* it would be obvious to the informed reader" that the variant would have no material effect on the way in which the invention worked.[14] As we shall see, this restriction often renders the application of the

[13] See further Chapter IV, above.

[14] *Catnic, op cit.* at 243. (emphasis supplied)

question impossible in cases that concern 'pioneer' patents,[15] as alternatives obvious at the time of infringement may never have been contemplated, or even have been possible, at the date of publication. It is also difficult to fit this requirement in with the justifications of the patent system discussed in Chapters III and V (above). The traditional incentive arguments would suggest that the scope should be determined at the time of application,[16] as is validity, and the more generous reward theory dictates that the assessment should be made at the time of infringement. Indeed, as noted, this latter view would allow the determination of scope to fit in far better with the teaching of the patent and reduce the inventive no-man's-land surrounding the grant.

Lord Diplock's formulation is often exalted as providing certainty to the process of claim interpretation, and by adopting the mantle of the skilled addressee we clearly see an objective standard being applied. However, reliance on an objective interpretation of the subjective intention of the patentee at a time when various pressures add to encourage speedy filing offers a standard that is far from certain. Additionally, when the level of the skilled man is so critical to the subsequent interpretation, the *Catnic* test appears to offer little more than a judicial licence to enforce, or excuse, on a whim.

The Legacy

Catnic's biggest positive contribution to claim interpretation appears to be the imposition of an objective assessment of what it is that the patent actually does. However, couching this in terms of an 'objective' interpretation of the subjective intention of the patentee, and operating under a presumption that the claims must be limited to their literal meaning unless this *cannot* have been intended, plants us firmly back at the feet of *Van der Lely* and its brethren. Limiting the assessment to the date of publication adds further restrictions in the field of fast-moving technologies. Nevertheless, despite the problems inherent in Lord Diplock's test, the decision appears 'fair' in result, and these issues could have simply withered and died if the case, as its factual matrix suggests, was limited to its context, the Patents Act 1949. However, in a

---

[15] i.e. patents representing a "spectacular technical contribution". See Scherer, *Industrial Market Structure and Economic Performance*, (1980; Houghton Mifflin, Boston; 2nd Ed.) (Hereinafter; Scherer, *Market Structure*), at 448. One such example is given by the facts of *Kirin-Amgen v Hoechst Marion Roussel, [2003] RPC 31* discussed in text accompanying note 86, *et seq.*, below.

[16] For the patent can only provide incentive to invent or to innovate in the point up to the application stage, after this time the focus necessarily passes into realisation of the incentive.

"miraculous sleight of hand"[17] subsequent cases have held that Lord Diplock's approach is consonant with that required by the Protocol. Therefore, whilst it has been forcefully argued that *Catnic* should have no relevance to the interpretation of the claims of patents granted under the 1977 Act,[18] a bastardised version of the test (now branded the 'Protocol Questions')[19] still governs claim interpretation in the U.K.

It is *Catnic*'s timing that presents the most unfortunate aspect of the case, for whilst not mentioning the Protocol explicitly, it is almost inconceivable that Lord Diplock was not aware of its effect when delivering his judgment. Therefore, it is tempting to conclude that he (apparently)[20] altered this aspect of the law in order to provide a Protocol-aligned test in the U.K. The attractiveness of this conclusion is enhanced when one considers Jacob's contemporary comment on the coming of the 'new' law, that: "It seems therefore that the Protocol adds virtually nothing to our existing methods of construction...".[21] Thus, if the position extant in 1978 was assumed to be in line with the Protocol it seems impossible that a modification of the test to make the assessment 'fairer' could somehow misalign the U.K. approach. It is, perhaps, unsurprising that *Catnic* therefore finds itself adopted as *the* test to be applied under the new law when the first cases concerning 1977 Act patents finally reach the Court of Appeal.

Catnic begets *Improver...*

As noted in relation to the German implementation of the Protocol, it took a number of years before decisions concerning the new statutory regime began to filter through to the appellate courts. In contrast to Germany, where the first cases concerning the new legislation arrived in the Supreme Court in 1985,[22] in the U.K. there is hiatus in evidence

---

[17] Norman, *Determining the Scope of the Patentee's Monopoly: Purposive Construction Revisited*, [1998] Anglo-American Law Review 221, (hereinafter Norman, *Purposive Construction Revisited*) at 238.

[18] See, for example, Turner, *Seven Reasons*, *op cit.* Also see the judgment of the Court of Appeal in *PLG v Ardon* [1995] RPC 287.

[19] See, for example, *Wheatley (Davina) v Drillsafe Ltd.*, [2001] RPC 133. Because, as noted in Chapter V in relation to the misbranding of the patent right as a monopoly, names matter. See also Robin Jacob's comment in *Industrial Property – Industry's Enemy*, [1997] IPQ 3 at 3, that "A squirrel is a rat with good P.R."

[20] Norman, *Purposive Construction Revisited*, *op cit.* argues that Lord Diplock's approach is not particularly novel in the light of *Henriksen v Tallon*, *op cit.* and *Beecham Group v Bristol Laboratories* [1978] RPC 153.

[21] Jacob, *Interpretation of Claims and Infringement*, in Vittoria (ed), *The Patents Act 1977*, (1978; Sweet & Maxwell, London) (hereinafter Jacob, *Claims and Infringement*) at 67.

[22] See text accompanying note 81 in Chapter VII, above.

post-*Catnic*[23] that lasted until the interim *Epilady* litigation (i.e. *Improver v Remington*[24]) decided in August 1988. This, in itself, is odd, as this period in time is not devoid of discussion of other provisions of the 1977 Act. The issue of construction, however, seems to have passed U.K. appeal courts by in the decade that runs from the Act's coming into force.

One possible explanation for the lack of discussion at this point in time relates to the fact that the converse position is evident in Germany in the same period. Whereas the German courts, especially the *Bundesgerichtshof*, felt that their practice did not conform to the Protocol and therefore went to great lengths to ensure change, the U.K. attitude was rather more Imperial in nature: current practice satisfied the Protocol, and no discussion would be entertained on the subject. This lack of cases therefore lends credence to the suggestion that Lord Diplock did indeed have one eye on this provision when issuing his judgment in *Catnic*. Furthermore, the lack of discussion of the topic of claim interpretation in this period served only to entrench the position. The law had effectively been frozen for 10 years by the time the first appeal case came to be decided in 1988. During this time practice had continued as normal[25] and the potential effect of any change of position had been magnified. Patents claiming priority as of the 1st of June 1978[26] were half way through their lifecycle by this time and the convenience of avoiding change, if nothing else, dictated that the 'settled approach' should be extended to the new provisions. As noted, this is in stark contrast to the German position, whereby a decision was clearly made that 'Third Period' practice did not conform to the Protocol and must therefore be changed.[27] Thus, in the first case in which the issue of claim construction under the 1977 Act reached the Court of Appeal little more was done than to confirm that *Catnic* was consistent with the Protocol.

Therefore, in *Improver v Remington*, the Court of Appeal at the interim stage stated that *Catnic* provided an approach that did indeed combine a fair degree of protection for the patentee with a reasonable degree of certainty for third parties, as demanded by the

---

[23] Which, as noted, was decided in the context of the 1949 Act anyway.

[24] *[1989] RPC 69*.

[25] Cementing Jacob's view, reproduced in text accompanying note 22 (above).

[26] i.e. the coming into force of the Patents Act 1977.

[27] This is not to say that the pace of change was rapid, nor that the transition was smooth, simply that the choice was made.

Protocol. The Court also noted, however, the differing opinions of the U.K. and German first instance judgments on the facts of the case,[28] concluding that they:

> "... cannot both be correct as interpretations of the same patent in accordance with the Protocol. Either one has fallen into the error of attaching too much weight to the strict literal meaning of the wording used in the claims, or the other has fallen into the error of extending protection from a consideration of what from the description as understood by a person skilled in the art the patentee may be supposed to have contemplated."[29]

Taken in the light of preceding Chapters, it is apparent that this 'black and white' view of the situation is clearly erroneous, and imparts too rigid an interpretation on the actual effect of the provision. To assume that one decision is correct, and that consequently the other is incorrect, misunderstands the nature of the Protocol, which aims at avoiding "extreme interpretation" of any of the official texts.[30] All that the provision states is that a position should be adopted between the extremes which combines fair protection for the patentee with a reasonable degree of certainty for third parties. On the basis of the foregoing discussion on the state of German claim interpretation at the time of the decision,[31] the outcome of *Epilady* was perfectly predictable. The courts were, admittedly, in a period of transition from the more liberal protection of the general inventive idea, but decisions in patent cases were never plucked from the ether. In terms of certainty the Utopian position imagined by the Court of Appeal, whereby a patent may be selected at random and assured the same degree of protection in whatever circumstance it finds itself litigated, is unrealistic in a national (let alone international) context. The fact that the thing is litigated in the first place reflects the point that different views can, and do, exist concerning its interpretation. However, this is not to say that the outcome will be any less predictable as long as one understands the national rules relating to its construction.

On a reasonable interpretation of the Protocol, the Court of Appeal's implicit assumption that there is only one correct position possible under it that combines a fair degree of protection for the patentee with a reasonable degree of certainty for third

---

[28] The reader will recall that parallel actions were brought in Germany, the U.K. and a number of other jurisdictions concerning alleged infringements of Remington's "Smooth and Silky" depilatory device.

[29] *[1989] RPC 69* at 76.

[30] See Armitage, *Interpretation of European Patents (Art. 69 EPC and the Protocol on the Interpretation)*, *(1983) 14 IIC 811*, at 814.

[31] See Chapter VII, above.

parties is absurd. The wording is simply not that precise and the requirement of certainty will depend greatly on the point from which the claims are viewed. Indeed, if we look at the *Catnic* decision using the mantle of a structural engineer (the designer) rather than a builder (the consumer) then the decision falls the other way – 'vertical' is a word of precision. The essential difference, therefore, between the English and German courts' treatment of the *Epilady* litigation is the focus of justification for the grant. In the U.K. the courts' approach concentrates, in traditional terms, on the incentives created by the patent and seeks to eradicate uncertainty. In Germany, by contrast, the focus at this point in time was still very firmly on reward of the patentee. Both approaches can be seen to be in accordance with the Protocol, in that they both tread a middle ground between extremes, but both necessarily provide different, although by no means less predictable, decisions. The choice of justification is largely historic, as has been shown in earlier Chapters, and is something which the Protocol makes no claim to address.

Improver at Full Trial

The implications flowing from the two-man Court of Appeal's foray into claim interpretation in the interim proceedings of the *Epilady* litigation were, however, far-reaching. Despite containing little more than bold statements of principle, noticeably devoid of actual reasoning to back them up, the fact that the words were uttered by the Court of Appeal was conclusive: *Catnic* was here to stay. Therefore, in the next patent interpretation case to come through its doors, counsel before the Court of Appeal agreed that the "guidlines [sic] enunciated by Lord Diplock represent the same approach as the approach now enjoined by the 1977 Act and the Protocol."[32]

Thus, at the substantive hearing in the *Epilady* litigation, Mr Justice Hoffmann (as he was then) was bound to follow the Court of Appeal's approach and adopt *Catnic*.[33] However, critically, instead of simply reiterating Lord Diplock's words, he reformulated the one *Catnic* question into a three-stage test by combining it with the paragraph that follows it in the decision itself. Therefore:

> "If the issue was whether a feature embodied in an alleged infringement which fell outside the primary, literal or acontextual meaning of a descriptive word or

[32] See *Anchor Building Products Ltd v Redland Roof Tiles Ltd*, [1990] RPC 283 at 287.

[33] See comments to this effect in *Improver v Remington*, [1990] FSR 181 at 190.

phrase in the claim ("a variant") was nevertheless within its language as properly interpreted, the court should ask itself the following three questions:

(1) Does the variant have a material effect upon the way the invention works? If yes, the variant is outside the claim. If no –
(2) Would this (i.e. that the variant had no material effect) have been obvious at the date of publication of the patent to a reader skilled in the art. If no, the variant is outside the claim. If yes –
(3) Would the reader skilled in the art nevertheless have understood from the language of the claim that the patentee intended that strict compliance with the primary meaning was an essential requirement of the invention. If yes, the variant is outside the claim.

On the other hand, a negative answer to the last question would lead to the conclusion that the patentee was intending the word or phrase to have not a literal but a figurative meaning (the figure being a form of synecdoche or metonymy) denoting a class of things which included the variant and the literal meaning, the latter being perhaps the most perfect, best-known or striking example of the class."[34]

The resultant *Improver* questions display, therefore, a subtle change in focus from the original *Catnic* formulation. The three-stage test necessarily narrows the approach to the essential question: is strict compliance, for whatever reason, demanded by the patentee? The presumption that arises by virtue of working through the initial stages of the *Improver* questions is that there must have been some reason for them to choose to utilise the words that they did in drafting the claim even though it is obvious that variants existed. Furthermore, by anchoring the assessment of the second question at the publication date of the patent, the test reiterates Lord Diplock's most restrictive criterion.

Applying the Test

Upon applying the newly-created questions to the facts of the case, Hoffmann J. considered that the substitution of the slotted rubber rod for the coiled helical spring called for by the patent had no material effect on the way in which the invention worked. Both devices operated by trapping and removing hair in a tweezer-like manner, both plucked "to the satisfaction of customers". Therefore, the differences, "so far as they exist, are not material."[35] Hence the first question was answered in the negative, and the assessment continued.

In answer to the second question, Hoffmann J. considered that this would have been obvious to the skilled addressee at the date of publication of the patent, even if it could

[34] *Ibid.* at 189.

[35] *Ibid.* at 192.

not have been used in all of the preferred embodiments. He cautioned against reading "obvious" in this context as one would read the word in relation to assessment of inventive step, stating that:

> "... the question supposes that the skilled man is told of both the invention and the variant and asked whether the variant would obviously work in the same way."[36]

This question is essentially asking whether the skilled addressee would have thought at the time of publication that the variant was a mechanical[37] equivalent of the claimed element. In other words, did it share all of the essential characteristics of the integer specified – here was it "bendy" and "slitty" – such that it could perform the function of the former if substituted for it, albeit not necessarily as efficiently? The Court considered that it could.

It was upon application of the final *Improver* question, however, that the claimant's case faltered, as Hoffmann, J., considered that the skilled addressee would have understood the patentee to have restricted themselves to the primary meaning of their claim. He stated that:

> "This is not a case like *Catnic* in which the angle of the support member can be regarded as an approximation to the vertical. The rubber rod is not an approximation to a helical spring. It is a different thing which can in limited circumstances work in the same way."[38]

In order to back up this conclusion, he considered that the problems associated with hysteresis and the fact that the plaintiff inventors had done no work on rubber rods. This provided the answer to Lord Diplock's rhetorical question of why the patentee should wish to restrict his invention to the specified embodiment only, therefore making avoidance easy. However, the fact that avoidance would be easy only becomes apparent when the skilled addressee is informed of the function of the claims and the rules relating to their construction. Yet Mr. Justice Hoffmann ends his application of the law to the facts of the case by stating that he did not believe that the skilled man "is also to be assumed to be skilled in patent law". Therefore, "he would ... be entitled to think that the patentee had good reason for limiting himself, as he obviously appeared

---

[36] *Ibid.*

[37] In this case.

[38] *[1990] FSR 181* at 197.

to have done, to a helical coil."[39] As already noted in relation to *Catnic*, this conclusion is more acceptable if the claims are held not to be directed to a person who wishes to perform the invention, but rather someone interested in designing around it.

Reference to Germany

Addressing the different outcome in the German proceedings, Mr. Justice Hoffmann explained that the other court had failed to address the final *Improver* question, instead they concluded after considering the first two issues of fact.

This is not, however, strictly the case for, as noted in Chapter VII (above), the German court considered that the skilled addressee would interpret the coiled spring by looking to its purpose. It was not being used as a spring *per se*, but rather as an elastic body with gaps to trap hair. The German reader of the specification in question would therefore consider that the patent should be interpreted with this purpose in mind, and would think nothing more of it. Seen in this manner it is clear that the final question is not simply left out, it is rendered unnecessary by the legal construction of the meaning of the claims at an earlier juncture. This approach is, in fact, entirely consistent with *Catnic* itself for just as 'vertical' was interpreted as meaning 'vertical for all practical purposes', so the helical spring of the *Epilady* device was interpreted with practical considerations in mind by the German Court. Furthermore, by this point in time, the determination of patent scope was, thanks to the efforts of the Supreme Court, sufficiently grounded in the wording of the claims to overcome criticism on the basis that it did not comply with the Protocol.

The Dissenting View

Notwithstanding the fact that *Catnic* and *Improver* have been the subject of sustained criticism since their inception, their utility in marking out a test to be applied cannot be doubted. This point alone lends credence to the argument that the decision to follow *Catnic* under the new law was, in many ways, correct. We find support for this statement if we compare the prevailing British position with that of Germany at the same point in time. For if it is accepted that the act of change itself necessitates uncertainty that contradicts the aims of the Protocol then, whilst the lower German courts had change forced upon them by what the Supreme Court considered to be clear

[39] *Ibid.*

inconsistency with the spirit of this provision, the British judiciary were in a rather more peculiar position.

As noted in Chapter VII, the practice of the German courts in the Third Period had led to criticism on grounds that the scope offered by utilising the standard of the 'general inventive idea' and detaching protection from the wording of the claims lead to unacceptable levels of uncertainty. Therefore any modification of this principle, although adding uncertainty of its own, would actually provide no net increase in this level as long as the position moved to a more objective assessment overall. The situation in which the U.K. courts found themselves, however, was rather different. To begin with, the period that passed between the passage of the new law contained in the 1977 Act and the first cases to reach the Court of Appeal was inordinately long when compared, for example, to that witnessed in Germany.[40] Furthermore, the leading decision under the old law (i.e. *Catnic*) had actually been decided after the passage of the new law, and it was generally thought to be inconceivable that the Protocol was not within Lord Diplock's contemplation when laying down the test. In any case, the interpretative provision was considered to add "virtually nothing" to the methods of construction extant immediately before *Catnic*.[41] The fact that the test was now 'fairer' therefore cemented the view that the U.K. approach was in compliance. In addition to these factors, the single dissent that could have affected the progress of the *Catnic/Improver* questions was quickly and effectively crushed by the promotion of Aldous, J., to the Court of Appeal. As a piece of judicial intervention, this latter factor is most significant, and is an issue to which we now direct our attention.

The Appeal in *PLG*

PLG Research v Ardon International[42] concerned a patent for methods of producing stretched plastic netting that required the starting material to be "substantially uniplanar". The alleged infringement used material into which grooves had been cut,

---

[40] As noted above, the interim appeal in *Improver v Remington* was the first case dealing with claim interpretation to reach the Court of Appeal under the new Act.

[41] The reader is, once more, directed to Jacob, *Claims and Infringement, op cit.* at 67, such that: "It seems therefore that the Protocol adds virtually nothing to our existing methods of construction...". See also comments to this effect in *Southco Inc. v Dzus Fastener Europe Ltd.*, [1992] RPC 299, per Purchas, LJ. at 312. Also *A.C. Edwards v Acme Signs & Displays Ltd.*, [1992] RPC 131 per Fox, LJ. at 136.

[42] [1995] RPC 287.

this was accepted not to be strictly uniplanar but had been engineered to achieve the same benefits when stretched, i.e. strong junctions and low waste. The question before the Court was therefore whether it could be described as "substantially uniplanar" and thus fall within the claims.

At first instance, Aldous, J., had applied *Catnic*, coming to the conclusion that there was no infringement.[43] The Court of Appeal, picking up on the problems associated with differing approaches to the construction of claims in the U.K. and Germany (highlighted by the *Epilady* litigation), suggested a radical alternative approach. Millett, LJ., giving the judgment of the Court, began his discussion in traditional terms by considering the development of U.K. law on the matter of construction. He examined both *Catnic* and *Improver*, but then departed from 'accepted practice' and went on to embark upon a reasonably extensive examination of German case law in this area. During this discussion he made reference to *Ion Analysis*, *Heavy Metal Oxidisation Case*, *Handle Cord for Battery*, discussed in Chapter VII above, and concluded that when applying the Protocol:

> "...the German Courts, no less than ours, insist that the scope of a patent must be determined by its language; and, while the extent of protection goes beyond the literal content of the claim to cover functional equivalents it does not go beyond functional equivalents which are deducible from the wording of the claim."[44]

Therefore, when considering the extent of protection, Millett, LJ., stated that the test that the German courts apply is to ask whether the variant is 'deducible' from the "wording and drawings of the claims."[45] He continued, opining that this is "not quite the same as the third *Catnic* question," but is arguably more in conformity with the Protocol, which requires a fair measure of protection for the patentee.[46]

As noted in Chapter VII, above, the German approach under *Formstein* had ostensibly modified Third Period practice, but the substance of the test still allowed a scope of startling similarity to that available under the pre-Protocol law. Millett is correct when

---

[43] Aldous, J's judgment is reported at *[1993] FSR 197*.

[44] *[1995] RPC 287* at 309.

[45] *Ibid.* This is an odd choice of phrase, and it is assumed that what was meant is that the variant is deducible from the claims read in the light of the specification and the drawings. Indeed, this is the view that the Court of Appeal takes of this passage in *Kastner v Rizla*, *[1995] RPC 585*, discussed below.

[46] *[1995] RPC 287*, at 309.

he states that this is not quite the same as *Catnic*, but fails to appreciate that this may not necessarily be a bad thing.

He continues, stating that *Catnic* was a case that concerned the common law of patents, a law "replaced by the approach laid down by the Protocol,"[47] and that therefore it should be "left to legal historians". This is because "if the two approaches are the same, reference to Lord Diplock's formulation is unnecessary, while if they are different it is dangerous".[48] These arguments, whilst superficially attractive, are somewhat misplaced.

The problem arises due to the fact that this rigid approach to the Protocol does not correspond to either its purpose or effect. As has been noted, it was drafted in order to guard against "extreme interpretation" of any of the official texts,[49] and it is submitted that it cannot be viewed as anything else. The implicit assumption in *PLG* is that there is a right and a wrong path under this provision, and that as the U.K. courts err on the side of literalism they therefore do not respect the requirement of showing fairness to the patentee. This is exactly the same argument (viewed from the opposite side) as is advanced by the Court of Appeal in the interim hearing in *Improver v Remington*; it fails for the same reason – the Protocol is simply not that precise.

This matter aside, it is prudent to investigate the effect of the re-formulation in *PLG*. The argument explicit in the case is that the *Catnic* questions[50] are not required and that rather than following Lord Diplock's approach, the Court should simply apply the Protocol. However, the only guidance that is provided relates to the application of the third question. Therefore, we get the slightly perverse effect of perpetuation of the *Catnic* approach, albeit in modified form.[51] The modification of the final question essentially asks whether the skilled addressee could have deduced the variant from the wording of the claims. This is a test akin to the determination of inventive step and, in essence, asks whether the variant is made obvious by the teaching of the patent. It is

---

[47] *Ibid.*

[48] *Ibid.*

[49] See text accompanying note 10 in Chapter VII, above.

[50] As reformulated by Hoffmann, J. in *Improver v Remington.*

[51] See Norman, *Purposive Construction Revisited, op cit.* at 248 for this point.

therefore a question of fact (and not strictly construction), and simply reiterates the second *Catnic/Improver* question.

Moreover, the adoption of the "deducible from the claims" test is startlingly reminiscent of the formulation applied under protection of the 'general inventive idea',[52] an approach that the *Bundesgerichtshof* had been at pains to change. The conclusions that the Court in *PLG* draws from the quoted passages of *Handle Cord for Battery* therefore represent a subtly skewed view of the case. For example, Millett, LJ., focuses on the statement that "the average person skilled in the art would have been able to discover the [variant] ... from the wording and literal sense of the patent claim," as providing the test for infringement.[53] Yet when the judgment in *Handle Cord* is read, it is clear that this phrase is used as an illustration of what is missing in the comparison between the patent and the alleged infringement in the case. Furthermore, the *Bundesgerichtshof's* statement that skilled addressee must be able to "identify the modified means ... as being equally effective in the solution of the problem underlying the invention," passes almost unnoticed.[54] This latter limitation suggests a test more along the lines of the variant being 'immediately apparent' rather than simply 'deducible'. Therefore, it is submitted that the interpretation placed upon the German cases is, in itself, wrong.

In addition, the effect of changing the approach to claim interpretation in the manner that the Court suggests *at the time of the appeal* would have been far more wide-ranging than Millett, LJ., seems to appreciate. A modification of this apparent magnitude would have represented a paradigm-shift in the enforcement of British patents, and the overnight conversion to asking what the skilled addressee *could* deduce from the claims as a determinant of their scope simply came too late to have any chance of being accepted. One reason for this is the gravity of the change, for it simply fails to take into account the fact that the practice surrounding the grant and enforcement of a patent in the U.K. had, by this time, become settled in the *Catnic* way of things. Patents were drafted with narrow formulation in mind as, not only is this the safest style to adopt, but also because, from the beginning, the patent attorney is concerned with preventing designing around the invention. The focus is clearly on maximising the scope of

---

[52] See text accompanying note 54 *et seq.* in Chapter VII.

[53] *PLG v Ardon, op cit.* at 309.

[54] Reproduced in *PLG v Ardon, ibid.*, but not emphasised in the text.

protection by other, non-interpretative, means – i.e. by manipulating the intrinsic scope of the patent rather than relying on *ex post facto* judicial intervention. This approach leads to claims that are not necessarily as 'tight' as those that would have been accepted by the German Patent Office in the Third Period, where they were required to be drafted in a prescribed form. Therefore, as noted in relation to the Japanese patent system,[55] institutional practices operate to mitigate the otherwise harsh effects of the law as best they can. However, what the changes suggested in *PLG* fail to do is to attack the fundamental restriction in the *Catnic* test, the fact that the assessment is to be made at the publication date of the patent. Thus, the position concerning pioneer inventions is no different under the *PLG* test than it was before. In other words, in the area in which the patent system is most important (according to Scherer's topology[56]) there is not only no net gain, but in reality a retrograde step taken as there is no increase in fairness to compensate for the increase in uncertainty.[57]

The Reaction

It is perhaps unsurprising that less than two weeks after the judgment in *PLG*, Mr. Justice Aldous refused to follow the approach of the Court of Appeal, declaring Millett, LJ.'s new test to be *obiter*.[58] He came to this conclusion because of Millett's own concession that the use of the word "substantially" in the *PLG* claim "imports a degree of flexibility which precludes an exact and literal construction, and makes it unnecessary to consider whether Lord Diplock's purposive construction was an accurate if proleptic application of the Protocol."[59] However, it is Aldous's comment that he would be "loathe to discard 14 years of case law unless it is certain that "purposive" construction is not the correct approach under the Act," that really cuts to the heart of the matter.[60] The uncertainty that changing to the *PLG* approach would have engendered by removing the framework of the *Catnic/Improver* questions was simply too much to contemplate at this point in time.

---

[55] See Chapter VIII, above.

[56] Scherer, *Market Structure*, *op cit.* at 443-50. See also text accompanying note 42 *et seq.* in Chapter V, above.

[57] Caused both by the 'new' test and the act of change itself.

[58] In *Assidoman Multipak v The Mead Corporation*, [1995] RPC 321.

[59] See *Assidoman*, *ibid.* at 337, referring to *PLG v Ardon*, *op cit.* at 309.

[60] *Assidoman*, *ibid.*

However, the development that cemented the demise of *PLG* was Mr Justice Aldous's promotion, shortly after the decision in *Assidoman*, to the Court of Appeal. Therefore, in *Kastner v Rizla*,[61] just 7 months after Millett's radical departure from *Catnic*, the now Lord Justice Aldous was effectively able to confirm his opinion that *PLG* was *obiter*.

So *Catnic* lives on...

Whilst convincing arguments can be made for the shape that a patent system should adopt to enable it to achieve the 'goals' of providing protection for invention/innovation in the first place, this shape necessarily varies as the justifications and rationales of patent protection vary. In addition, the economic theories discussed in Chapters III and V, above, all suffer from criticism on the basis that they are theoretical without evidence of applicability outside of the limited confines of the handful of cases on which they can be seen to be based. In no instance is, or indeed could, a general theory be pronounced. The reason for this failing is the non-Utopian nature of the markets and contexts in which the theories are based. In no case is a law being designed in the abstract, and changes to the *status quo* must take into account the fact that the process of change will, itself, cause disruption.

Aldous's comment in *Assidoman* about 'discarding' case law to follow *PLG* really does expose the fundamental issue. Regardless of the actual effect that the change of test would have had, and it is submitted that the modification to the third *Catnic/Improver* question may not actually have been that great in practice, it was *perceived* to mark a significant departure from the British way of doing things. Thus, the criticisms simply came too late to make their implementation possible without causing significant uncertainty whilst a new practice became established. The essential difference between the British and German approaches, post-Protocol, was that the *Bundesgerichtshof* clearly believed that its own Third Period jurisprudence was not in compliance with the Protocol, so change was implemented at an early stage. This, therefore, concentrated the uncertainty brought about by such upheaval and enabled practices surrounding the grant to modernise in approach. To adopt the recommendations of the Court of Appeal in *PLG* would have meant enduring the turmoil seventeen years late. Additionally, as noted, the fortuitous (or unfortunate, depending on which view is

---

[61] *[1995] RPC 585*. Discussed by Cole, *Kastner v Rizla: A Historic Decision on Equivalents? [1997] EIPR 617*, and Oliver, *Kastner v Rizla: Too Far, Too Fast, [1996] EIPR 28*.

taken) timing of the *Catnic* decision effectively precluded this turmoil in the first place. This is the essential point on which any rational decision must have been based.

Improver Begets the 'Protocol Questions'

The years following the decision in *Kastner v Rizla* are relatively empty of substantive claim interpretation cases. This is possibly because of a 'bedding down' of the opinion that *Catnic/Improver* did indeed dictate the test to follow under the Protocol, however, it may also have something to do with comments made by Lord Hoffmann in *Biogen v Medeva*, that:

> "Where the application of a legal standard such as negligence or obviousness involves no question of principle but is a simple matter of degree, an appellate court should be very cautious in differing from the judge's evaluation."[62]

The cases that we do see in which claim interpretation was discussed at appellate level are, in the main, straight applications of the test and are therefore of little interest to our investigation.[63] The silence on substantive discussion of the provisions was broken, however, by the appeal in *Wheatley (Davina) v Drillsafe*, decided in July, 2000.[64]

Here, in a Court consisting of Aldous, Sedley and Mance, LJJ., the approach to infringement and claim construction was discussed in some detail. The patent itself was relatively simple, lying in the field of mechanical engineering, this alone may have encouraged such an investigation. The case is notable not only for the fact that it opened up the debate and re-branded the questions (*Catnic/Improver* became the 'Protocol' questions), but also because it represents a subtle shift in the degree of protection accorded to the patentee.

Wheatley v Drillsafe

The patent in question concerned apparatus for the cutting of threaded holes, in particular in petrol tanks and other tanks bearing flammable liquids. Due to their size, the holes were generally cut using annular[65] cutters that bore teeth on their outer edge. The problem with this method was that the cutting rig tended to wander during use,

---

[62] [1997] RPC 1 at 44.

[63] i.e. *Union Carbide v BP*, [1999] R.P.C. 409 and *Scanvaegt v Pelcombe*, [1999] F.S.R. 786.

[64] Reported [2001] RPC 133.

[65] i.e. ring shaped. The typical design of a conventional cutter is described at paragraph 8 of the judgment.

leading to inaccuracy. The prior art solution to the problem was to provide a guiding drill at the centre of the ring, thereby providing an anchor point and preventing the rig from straying from the intended cut site. However, the trouble with this set up was that the guiding drill pre-penetrated the tank, giving rise to a risk of sparks and therefore ignition of the petrol vapour within. The patentee had created an invention in which this problem was obviated by utilising a resilient mounting arrangement and a "centre-less hole cutter" which did not pre-pierce the tank.

The defendants adopted a number of methods of achieving the same end, including (as 'method 2') apparatus comprising an annular cutting device that contained a retractable probe or spindle at its centre. The spindle's function was to control the rig's tendency to wander. Importantly, however, it did not pre-penetrate the tank. The question that presented itself to the Court, therefore, was whether this came within the definition of a "centre-less hole-cutter" and thus infringed the patent. The answer was divisive, with Aldous, LJ., in the minority, considering that it did, and Sedley and Mance, LJJ., coming to the conclusion that it did not. Despite this difference of opinion, the majority accepted that Aldous's exposition of the law was accurate, they simply doubted his conclusions.

A Radical Approach

Lord Justice Aldous began his judgment by referring to the problems that the patented invention set out to solve, thereby placing the grant firmly in context.[66] He then proceeded to look to the alleged infringements. The defendant's had employed three methods. The first ('method 1') was accepted by all parties to fall within the contested claim, as the cutting apparatus was centre-less in the literal sense of the word. Method 3, on the other hand, employed a guiding drill of the type disclosed by the prior art and shared its spark-related problems; this was clearly outside of the claim. However, as noted, it was 'method 2', utilising a retractable 'guiding probe', that presented the main issue of construction in the case.

Moving on to examine the applicable law, Aldous, LJ., began by considering the British provisions on infringement, namely ss.60 and 125 of the 1977 Act, before moving on to look at Article 69 EPC and the Protocol. He summarised the effect of the latter by

[66] Indeed, the structure that he adopts points to a finding of infringement from the beginning.

stating that it "outlaws what can be termed strict literal and also liberal interpretation using the claims as a guideline. The correct approach is to achieve a position between those extremes...". In pursuing this goal, "[s]o far as the patentee is concerned it is important that the claim should be interpreted in accordance with his intention."[67]

He continued, stating that the *Improver* questions, "better called the Protocol questions" can be utilised as an aid in the process of assessing objectively what meaning the words of the claim were intended to convey.

This change of name is, in itself, significant as it suggests a willingness to move away from the erstwhile imperialistic view of the scope of protection towards a more Protocol-centric test. Furthermore, the fact that the questions are categorised as "an" aid in the process of assessing the meaning of the words in a claim intimates that there may be other approaches that are also consistent with the Protocol. This conclusion is, in the opinion of this author, to be applauded.

Aldous, LJ., then issued what is probably the most significant statement in the case:

> "It is reasonable to infer, *absent express words to the contrary*, that the patentee *intended to include within his monopoly what can be termed immaterial variants*, in the sense that they were not material to the way the invention worked.... However, third parties have to be considered and, therefore, they should not be held to infringe if it was clear that such a variant was not intended to be within the ambit of the monopoly, either because of the words chosen or because it would be seen to have materially affected the way the invention worked."[68] (emphasis supplied)

Therefore, whilst adhering to the form of the Protocol (nee *Catnic/Improver*) questions, Aldous, LJ., provides a subtle shift in the degree of protection. As noted above,[69] the restriction on the objective view of the intention of the patentee laid down in Lord Diplock's original test gives rise to one of the main areas of criticism in the decision. The precise logic of presuming that the patentee must have meant to exclude all variants unless this *cannot* have been their intention, as was the position under *Catnic*, was never entirely clear. Suddenly, in *Wheatley* it is swept away, and we see what could, and perhaps should, have been done in *PLG*. Rather than removing the comfort of the

---

[67] *Wheatley (Davina) v Drillsafe, op cit.* at 141 (paragraphs 19 and 21 of the judgment).

[68] *Ibid.* at 142 (paragraph 23 of the judgment).

[69] See text accompanying note 12 *et seq.* above.

Catnic/Improver formulation, a tried-and-tested favourite of the judiciary, a presumptive burden within it is changed and a more benevolent interpretation made possible.

Whilst accepting that the defendant's probe design did not correspond to the literal meaning of "centre-less", Aldous, LJ., thought that the skilled addressee would nevertheless believe it to fall within the scope of the patent. He reasoned that all of the patent's teaching was directed to overcoming the problem of pre-penetration of the tank. The description mentioned the benefits of the invention in the following terms: "By using a centre-less hole cutter (that is a hole-cutter not having a drill for forming a pilot hole), this early opening of the tank is obviated."[70] To read "pilot hole" as including a blind hole that did not penetrate the tank would be to make "nonsense of the sentence."[71] The alternative formulation, i.e. interpreting the words "centre-less" literally, would mean that there was no infringement, but Aldous reminds us that this is outlawed by the Protocol.[72]

Therefore, when applying the 'Protocol questions' he considered that the addition of the probe would have no material effect on the way in which the invention worked, and that this would have been obvious to the skilled addressee at the publication date of the patent. Therefore, moving on to the final question, whilst accepting that the "centre-less hole cutter" was an essential feature of the claim, he believed that this phrase should be interpreted so as to include the probe.

> "The ... skilled reader would interpret the claim as excluding anything that penetrated the tank lid before cutting had been completed. The words "centre-less hole cutter" are not terms of art. They have been used by the patentee to distinguish the conventional cutter ... and the prior art..."[73]

He concluded that the answer to the *Improver* questions indicated that there was infringement, however "they are only an aid to the decision which requires the claims to be interpreted to give fair protection and reasonable certainty." Applying the Protocol directly, Aldous, LJ., stated that the patent disclosed a method of creating a hole in a tank *in situ* with a cutter and a tap with no pre-penetrating parts. "Fair protection would

---

[70] *Ibid.* at 143 (paragraph 28 of the judgment).

[71] *Ibid.*

[72] *Ibid.*

[73] *Ibid.* at 145 (paragraph 37 of the judgment).

enable the patentee to monopolise just that... That would also give reasonable certainty."[74]

The Majority View

Despite deferring "entirely to the exposition of the law given by Aldous LJ.,"[75] the majority of the Court of Appeal disagreed with his conclusions on whether there was, in fact, infringement of the patent. Sedley, LJ., considered that "the critical question is in the end one of first impression: is the appellant's device a centreless hole-cutter?"[76] As it had a central drill as its locating device, he concluded that was not.

Lord Justice Mance gave the issue far lengthier consideration, but came to the same conclusion: there was no infringement. Utilising reasoning very similar to that of Hoffmann, J., in *Improver*, he considered that:

> "...when conceiving and describing their invention, the appellant patentees did not contemplate the introduction of any central device, serving to centre the hole cutter. Either the idea of a centring device which did not pierce the integrity of the tank did not occur to them or, if it did, they put it aside for reasons which must have seemed good at the time.... If the appellants had seen this possibility, and intended to cover it, as a worthwhile development, I have no doubt that they would have expressed themselves differently and made that intention clear."[77]

Therefore, despite accepting Lord Justice Aldous's interpretation of the law, Mance, LJ., seems to consider that the nature of the patentee's specification suggested that they had not intended, for whatever reason, to include variants of the type employed by the defendant within their scope of protection. Turning to the Protocol questions, he considered that the first two should be answered in the patentee's favour. The result to the third, however, was tainted by the fact that the appellants:

> "...did not realise or consider that there was any or any workable solution, involving the use of a centrally positioned centralising drill or device, which would resolve the problem of penetration into the tank while at the same time avoiding the problem of wandering... The applicants' inventiveness involved, but was limited to, the recognition that penetration could usefully be achieved by the annular cutter."[78]

---

[74] *Ibid.* (paragraph 38 of the judgment).

[75] Per Sedley, LJ., *ibid.* at 151. Mance, LJ., issues a similar statement at the beginning of his judgment on the same page.

[76] *Ibid.*

[77] *Ibid.* at 155 (paragraphs 83 and 85 of the judgment).

[78] *Ibid.* at 157 (paragraph 90 of the judgment).

As Dunlop states, the "majority on the Court of Appeal believed that the patentee's failure (which the court interpreted as being a matter of choice) to claim some broader formulation was the overriding consideration."[79]

Comment

The appeal in *Wheatley v Drillsafe* provides clear illustration that even where a single court is considering a patent, and therefore all of those presiding over the issues have access to the same expert witnesses and apply the same legal tests, differences of opinion can still arise. The majority's approach is somewhat lamentable given Lord Justice Aldous's benevolent formulation of the main legal points; however, given the British courts' past practice it is far from surprising.

Aldous's reversal of the presumption of intention, endorsed by the rest of the Court, is most significant. Not only does it represent a 'U'-turn in his own erstwhile rather conservative views on claim interpretation, but it also effectively manages to align U.K. and German practice in a manner that is far more acceptable than the incomplete formulation in *PLG*. By retaining the final 'Protocol' question, the British courts can be content that certainty is respected, for the same formulation is utilised as before. However, the answer to this question now takes into account the reality of the situation and the fact that the patentee should only be restricted to the literal wording of their claims where a more benevolent interpretation is clearly inconsistent with their intention.[80] His application of the test is also interesting as it represents a truly purposive construction: looking at the patent from the point of view of the problem that is to be solved.

Mance, LJ.'s approach, on the other hand, clearly follows the orthodox route. His judgment discusses fairness in the context of certainty, so that the appellant's 'inventiveness' is seen to be limited to a scope explicitly asked for – in this case hole cutters without a central spindle.[81] The implicit argument here seems to be that to expand the patent's effect beyond this point would be to add an uncertain degree of

---

[79] Dunlop, *Court of Appeal gets to Grips with the Protocol*, [2003] EIPR 342, at 345.

[80] i.e. it *cannot* have been their intention.

[81] The reader will note the parallels between this approach and the comments of those patent attorneys adopting what was described as the 'traditional view' in Chapter IV, above. See text accompanying note 16 in Chapter IV.

protection, and that this would not be fair to the patentee or to third parties. Therefore, the monopoly shadow cast by the patent should be limited to that explicitly claimed, and no more. In this context, "if the appellants had seen [the possibility of a non-penetrating centre spindle]... and intended to cover it, as a worthwhile development, I have no doubt that they would have expressed themselves differently and made that intention clear."[82] Thus, whilst deferring to Aldous, LJ.'s exposition of the law, the majority appear to believe that, as this was an invention in a mature field of technology, the patentee[83] could easily have conceived that there might be different methods of achieving the main innovative aim, i.e. avoiding pre-penetration of the tank. Mance, LJ.'s approach therefore comes perilously close to assessing the invention with hindsight and asking why the inventor did not expressly include such an obvious variant within their scope of protection. This method views the failure to claim as being a matter of choice, which cannot be correct, and, as Dunlop suggests, leads us to a question that is critical to some of the most recent judgments. "What if the draftsman could not possibly have envisaged the variant at the time of filing?"[84]

Recent Developments

Despite marking a significant advance in the manner in which a patent is to be interpreted, *Wheatley* does not address Lord Diplock's most restrictive criterion: the fact that the patent is to be interpreted as of the date of publication. This limitation, as noted above, operates most significantly in the field of pioneer advancements, defined by Scherer as representing a "spectacular technical contribution".[85] It impacts strongly upon these inventions because at the time of their creation techniques in that area would, by definition, have suggested only narrow routes down which to progress. As time goes on, and the rest of technology catches up with the advancement, other methods of arriving at the result will inevitably be found that may fall outside of the literal scope of the claims, but nevertheless utilise the patent's teaching. This, in essence, is what occurred in *Kirin-Amgen.*[86]

---

[82] Per Mance, LJ., in *Wheatley v Drillsafe, op cit.* at 155 (paragraph 85 of the judgment).

[83] Or at least the person drafting the patent.

[84] See Dunlop, *op cit.* at 345.

[85] Scherer, *Market Structure, op cit.* at 448.

[86] *Kirin-Amgen v Hoechst Marion Roussel,* [2003] RPC 31.

Kirin-Amgen

The case concerns a patent for the manufacture of erythropoietin (EPO), a polypeptide that functions to regulate the production of red blood cells. It claimed a method of producing the protein utilising genetic engineering techniques whereby the DNA sequence encoding EPO was isolated and cloned *outside* of the host cell before being inserted into it for production. The Court summarised this by stating that: "In effect the claim is to an exogenous DNA sequence suitable for expressing EPO when introduced into a host cell."[87] The alleged infringement utilised very different means to achieve the same result. Rather than isolating the DNA sequence, it used a process known as 'gene activation'. Starting with a cell in which the EPO gene was already present but dormant,[88] 'switched off' by a negative regulatory element (NRE), the defendants' technique introduced a nucleotide sequence that effectively overrode the NRE and 'switched on' the gene. This caused the cell to produce EPO.[89]

The Court considered that the defendants' process did not fall within a literal reading of the claim because there was no "host cell", called for by the patent, due to the fact that everything happened internally.[90] Therefore, moving on to consider whether the process infringed under a purposive construction of the claims, it applied the Protocol questions.

Having regard to the level of generality with which the invention was described in the claims of the patent, the Court considered that the answer to the first question must be 'yes'. This conclusion therefore overturned the judgment of Neuberger, J., at first instance, who was of the view that the only significant variant was the use of the activation technology and that this had no material effect on the working of the invention. The Court of Appeal, whilst accepting that the discovery and sequencing of the gene that produced EPO was "at the heart of the invention", refused to accept that this was the level of generality with which the patent should be viewed. It concluded

---

[87] *Ibid.* at 62 (paragraph 52 of the judgment).

[88] This is the case in the majority of human cells, and for the majority of genes.

[89] The reader will appreciate that this is a very basic description of the relevant techniques. For a more in-depth discussion see paragraph 12 of the judgment, discussing the discovery and production of EPO; and paragraph 36 for a discussion of the defendants' technique.

[90] i.e. the process was endogenous.

that "[t]here are real differences between an isolated DNA sequence which is suitable for use in a host cell and a DNA sequence in which the cell needs activation."[91]

Having answered the first Protocol question in this manner, the Court stated that it was "not necessary to go on and consider the second question on the assumption that the answer to the first question should be in the negative". However, as a "considerable length of time was spent considering the judge's approach to... [the second] question," it deigned to comment.

The Court stated that, when answering the second question, it was important to bear in mind that it is "designed to secure a reasonable degree of certainty for third parties."[92] The judge had erred in viewing the way in which the invention worked in too broad a manner, so that the differences between the techniques were excluded from consideration. The essential point was that in 1984 (the filing date of the patent) the skilled addressee would not have realised that the allegedly infringing technique would work at all, let alone in the same way. Therefore there could be no infringement.

Comment

Utilising the filing date as the point at which the assessment is made is an interesting development. As noted above in relation to *Catnic*, assessment as of the publication date made no real sense when the aims/functions of the patent grant were taken into consideration. Therefore, in one respect, the Court of Appeal's insistence on the filing date is a positive step, as it aligns the determination of scope with the incentive function of the patent. However, although on a stronger intellectual footing, assessment at this date still unfairly prejudices pioneer innovation. The shift brought about by Aldous's comments in *Wheatley* and the resultant modification of the presumptive burden will simply not assist those cases in which the assessment fails at the first or second question.

As Dunlop notes, this approach does, at least, appear to be consistent with *Biogen v Medeva*, where the House of Lords held that the date at which the sufficiency of the disclosure should be assessed is the priority date. This is because "a variant cannot fall

---

[91] *Kirin-Amgen, op cit.* at 62 (paragraph 52 of the judgment).

[92] *Ibid.* at 63 (paragraph 57 of the judgment).

within the scope of the claim if such scope would not have been supported by the description at the filing date."[93] However, whilst this is one interpretation that can be placed on the information function of the patent, it fails to take into account the fact that the specification continues teaching long after it is filed. Indeed, one of the justifications of the system is that it encourages disclosure of information that may otherwise be kept secret.[94] Isolating this teaching and effectively freezing the information that the patent contains at the priority date represents a wholly unrealistic approach and fails to appreciate impact that subsequent developments may have, particularly on the scope of pioneer inventions.

Conclusion

The British approach to claim interpretation has come a long way from the pseudo-literal constraints of the House of Lords' decisions in *Van der Lely v Bamfords*[95] and *Rodi & Wienenberger v Showell*.[96] *Catnic* itself played a large part in this modernisation of approach, however, as noted, it also created a suspect legacy of narrow tests and dubious presumptions that hindered development of the law. The subsequent discussion of Lord Diplock's test in *Improver v Remington*[97] served not only to reformulate the questions, but also to highlight some of their most restrictive criteria. In addition, it began a process of solidification of approach that the radical view of the Court in *PLG*[98] simply came too late to remedy.

Lately, however, under what Turner describes as "the guise of loyalty to *Catnic*"[99] we can see a subtle shift in the interpretation of the patent towards more liberal construction. In this manner, the advances made by the Court of Appeal in *Wheatley v Drillsafe*[100] are, at least in the opinion of this author, to be applauded. Yet, by themselves they are not cause for overt celebration as there is much still to be done.

---

[93] Dunlop, *op cit.* at 349.

[94] See further, text accompanying note 124 *et seq.* in Chapter III.

[95] *[1963] RPC 61*.

[96] *[1969] RPC 367*.

[97] *[1989] RPC 69* (Court of Appeal, Interim); *[1990] FSR 181* (Hoffmann, J., substantive hearing).

[98] *[1995] RPC 287*.

[99] Turner, *Purposive Construction – Letter*, *[2001] EIPR 118* at 118.

[100] *[2001] RPC 133*.

Therefore, just as the House of Lords has recently revisited the issue of recklessness within the context of criminal damage,[101] and has overturned Lord Diplock's classic formulation in *Caldwell*,[102] this author respectfully submits that the time may also be ripe for departure from the more restrictive elements of the *Catnic/Improver*/Protocol questions. The main merit of the test, as interpreted, is the fact that it provides a logical framework for the courts to adopt and as it has aged and settled down the application has become softer without necessarily losing the degree of certainty that has been championed as its finest facet. However, it has significant problems associated with 'fast moving' technologies, such as biotechnology, that appear to reflect a certain degree of 'techno-fear' within the judiciary.

Therefore, it is suggested that Lord Diplock's utilisation of the publication date as the date at which the relevant assessment of the scope of the patent is made should be consigned to history. Assessment as of this date is littered with problems – not least of which those relating to the balance that is to be struck between fairness and certainty. The current model does not fit in well with the information function of the patent – exalted in cases such as *Biogen v Medeva*[103] where it will be recalled that the House of Lords imported the notion of support into the requirement of sufficiency within s.72(1)(c) of the 1977 Act. Neither does it adequately satisfy any of the economic justifications that can be advanced to support the grant of the patent in the first place. Even at its most basic level, if the patent is assumed to provide some sort of incentive or reward to those entities investing in the costly business of innovation, then reliance on the publication date as the date at which the patent stops teaching the skilled addressee is absurd. The disclosure that is required as consideration for the grant keeps performing even after it is published. As a disclosure, it creates an aura of impotence around the invention into which no other patent can stray, yet as it stands, it is only the shadow that the patent casts at the publication date[104] that the patentee can monopolise; all else is lost.

---

[101] In R *v G & Another (Minors)*, [2003] UKHL 50.

[102] [1982] AC 341.

[103] [1997] RPC 1.

[104] This is the more generous formulation for, as noted, the assessment in *Kirin-Amgen* was made at the filing date.

Furthermore, the current test results in the perverse situation that the most fundamental innovations, those in pioneer fields (that Scherer would describe as "revolutionary" and which can be characterised as having an uncertain cost/benefit ratio),[105] receive the least protection as the second *Improver*/Protocol question cannot be answered in the affirmative. This problem is highlighted by the appeal in *Kirin-Amgen*,[106] for whilst it seems that the courts are reasonably comfortable with patents in the more straightforward scientific and engineering spheres (traditional chemistry, mechanical and electrical engineering, etc.), biotechnology still causes problems. It may well be that this is because of the nature of the patentee in these industries,[107] however one cannot escape the feeling that the Court of Appeal is simply constrained by the current test.

By modification of the test in the manner suggested, so as to include variants made immediately apparent to the skilled addressee at the date of infringement, these problems would be solved. Furthermore, the courts would avoid the need for a major shake-up of the law in this area, for all of the building blocks of a new test are already in place. The assessment remains objective and the final *Protocol* question remains the same, therefore nothing is lost in terms of certainty, yet protection is broadened to encapsulate after-arising equivalents that are nonetheless immediately evident to the skilled addressee. Pioneer inventions would therefore get the protection that they rightly deserve and the yawning gap between the teaching and reward functions of the patent is closed. Moreover, the court still has the opportunity, should the situation dictate, to say that the allegedly infringing technology is so far changed from that disclosed in the patent that it falls outside of its teaching and cannot therefore be monopolised.

Indeed, this must be the interpretation that the House of Lords will approve given the amendments to the EPC agreed at the Munich Diplomatic Conference in November 2000 and adopted by the Administrative Council of the European Patent Organisation

---

[105] Scherer, *Market Structure, op cit.* at 443-50. See also text accompanying note 42 *et seq.* in Chapter V, above.

[106] *[2003] RPC 31*. Currently on appeal to the House of Lords.

[107] The reader may recall the comments made in Chapter IV concerning the arcane nature of some patentees' disclosures in this area.

on 28th June 2001.[108] Under this agreement Article 69 and the Protocol have been amended so that the latter now states:

> "(1) For the Purpose of determining the extent of protection conferred by a European patent, due account shall be taken of means which *at the time of the alleged infringement* are equivalent to the means specified in the claims.
>
> (2) A means shall generally be considered as being equivalent if it would be obvious to a person skilled in the art that using such means would achieve substantially the same result as that achieved through the means specified in the claim." (emphasis supplied)

If the House of Lords choose to endorse the Court of Appeal's formulation rather than adopting the revised text of the EPC then we risk *Catnic*-eqsue perpetuation of an outmoded test. This would be in no-one's interests, especially given the infrequency of appeals to this level on the issue of claim construction. However, other than changes to the date of assessment, it would appear that the current U.K. position is in broad compliance with the new text of the Protocol.

In short, the time has come for the U.K. courts to decide whether Britain is to be a leader or a follower in the field of high technology. The early British experience, and more recently that of Japan, clearly demonstrate that different scopes of protection may be appropriate at different stages in a country's development. In the opinion of this author, it is time for the U.K. to enter the 'Era of Intellectual Creation' as leader, and to pre-empt the changes that will be imposed by the revisions to the EPC. The appeal to

---

[108] Article 8 of the Act Revising the Convention on the Grant of European Patents (available online at: http://www.european-patent-office.org/epo/dipl_conf/pdf/em00003a.pdf) states that the revised EPC will "enter into force two years after the fifteenth Contracting State has deposited its instrument of ratification or accession, or on the first day of the third month following the deposit of the instrument of ratification or accession by the Contracting State taking this step as the last of all the Contracting States, if this takes place earlier." The European Patent Office anticipated entry into force within 3 to 5 years in June 2002, see http://www.european-patent-office.org/news/info/2002_06_07_e.htm.

the House of Lords in *Kirin-Amgen* presents a perfect opportunity for this goal to be achieved.[109]

[109] The appeal is scheduled to be heard in July 2004. It is timetabled to last for two weeks.

Some Final Comments

It has been the purpose of this study to explore some of the issues connected with the determination of patent scope in the U.K. During the course of our discussion we have searched for the purpose of the patent system, the bricks upon which it is built and against which it may be justified. As part of our discussion we looked at the historical factors that lead to the current British position and the perceived 'anti-monopolistic' sentiment within the patents court. The historical account is interesting for a number of reasons, not least in highlighting the fact that patents played a significant part in transforming English industry during the Reign of Elizabeth I. Therefore, in historical fact we find the first, and perhaps most important, reason for why we (as society) may wish to allow the grant of a time limited monopoly to the creator of a new manufacture: in order to secure teaching of those skilled in the craft within the Realm. This is the reason that the patent system was instigated, and it continues to be an important factor in its utility.

When first created, however, the custom of patent grants (for it could not yet be called anything more) was very different to that in existence today. To begin with, the system did not discriminate between true 'inventions' (in the modern sense of the word) and those manufactures imported from abroad: indeed, it was the latter that were specifically targeted. The small number of patents and the clear connection with Crown also made policing a far simpler affair. Moreover, the consideration for the grant was a great deal more straightforward: the Crown simply required that the invention be 'worked' within the Realm. The price of a patent has always, therefore, been disclosure, but at the genesis of the system it was provided in very different form to that required today.

It was only when the nature of invention changed so that new manufactures were conceived, rather than 'borrowed', by the British that we see a shift in the degree of protection sought by the patentee, and the specification makes its appearance. Therefore, in the period just before the Industrial Revolution, Nasmith and his ilk made the first tentative steps towards a modern grant in which the invention is described and the scope of protection demarcated by the patentees themselves.

The historical account of patents in the U.K. also enabled us to see some of the problems that have dogged the system since its inception. Therefore we noted the 'odious monopolies' granted in Elizabeth's Reign, and the continuation of abuses under

James I, that lead to the *Statute of Monopolies*. As we have seen, the *Statute* was enacted in response to some of the more problematic grants of the day and declared all monopolies to be contrary to the law and utterly void.[1] Patents for invention were excused from the rigors of this ban,[2] but it is clear to see where the view that they must be narrowly construed as an exception to an otherwise outright condemnation of monopolies originates.

The intense debate that surrounded the mobilisation of the 'Anti-Patent' movement in the mid-to-late-19th century provided the backdrop for a discussion of some of the 'classical' justifications of patent protection. This period in time was one of intense dissatisfaction with the operation of the system; it was expensive, unreliable and often seen as a barrier to the progress of industry. The debate therefore provides a valuable 'snapshot' of a point at which the grant had to be justified in order to maintain its existence. In addition, it provides evidence of a view that rendering temporary monopoly to the creators of new things may actually inhibit the progress of technology by providing a disincentive to invent, due to fear of litigation. It therefore enables us to see the other side of the coin, and begin to appreciate the effects that patent protection may have on downstream innovation.

Therefore, in seeking rationalisation of the grant, two distinct views are seen to be in evidence by the end of the 19th century. The first is that of the patent as a tool of commercial leverage, as reflected in the works of Smith, Bentham, Mill and others, and upon which most of the modern theory can be seen to be based. The second is that of the patent as a constraint on trade, the old monopoly argument, demonstrated by Macfie, Rogers, Grove and the other abolitionists. What is clear from the progress of the debate is that an unregulated market was seen by the majority on both sides of the argument to be unsuitable for the fostering of inventive activity. Where the views differed was in the choice of the best arrangement for that encouragement. At this point in time the legal system was ill equipped to deal with 'property' in the intangible, and therefore restricted it as one would restrict title deeds to land; requiring the invention to be defined accurately and precisely. This sentiment is reflected in the words of Lord Russell in his famous dicta in *E.M.I. v Lissen* when stating "[w]hat is not

[1] s.1 of the *Statute of Monopolies*. See Chapter II.

[2] By s.6 of the *Statute of Monopolies*.

claimed is disclaimed".[3] However, the underlying justifications for providing monopoly protection remained constant; patents were a method of safeguarding inventors from the pressures of competition in order that an economic reason to invent (whether it be incentive or reward) and disclose that invention could be found.

The nature of the patentee, and invention itself, had, however, undergone significant changes by the end of the 'Anti-Patent' debate. The image of the lone inventor was fading, replaced by a new corporate structure of research and development. Therefore, whilst the overriding justification for the patent system can historically be seen to be the idea of *individual* encouragement, this was changing. In essence the justificatory theories were becoming more abstract; there was a move away from focussing on invention towards innovation. As a consequence of this shift, and also due to increasing numbers of patents, the specification had assumed a far more central role in the grant. Thus, s.5(5) of the Patents Act 1883 introduced a requirement that the patentee explicitly 'claim' what they consider to be their invention.

The topic of the claims was picked up in Chapter IV when we considered the process of drafting the specification and gained insight into some of the reasons for seeking protection in the first place. Therefore, we looked at factors that determine the intrinsic scope of the grant, and saw the problems that face the patent attorney when creating the document. The discussion highlighted the fact that the traditional view of the patent may not provide an accurate measure of its effect. In particular, it emphasised that the grant is often sought for purely economic reasons connected with getting innovation onto the balance sheets. Therefore, it was perhaps misleading to ask what the purpose of the patent system is before examining its effect. In other words, rather than asking what the system aims to do, the key question may well be what does the system actually do?

This issue was discussed in Chapter V, when we considered the effect of the patent grant by examining some of the simple economics of supply and demand. In addition, we looked at the patent as 'monopoly' argument, and were able to conclude that, despite providing monopoly power, the grant is far from what may be called an 'economic

[3] *(1939) 56 RPC 23* at 39

monopoly'. However, such misbranding of the effects of the patent add to the prejudice with which it is viewed. Thus, in the same way that the monopoly rhetoric was utilised so effectively by the abolitionists in the 'Anti-Patent' debate (discussed in Chapter III), it still finds use today to apparently justify a narrow scope of protection.

In this Chapter we also introduced Scherer's topology of invention as a method of assessing the effects of various 'post-classical' theories of patent protection. However, it was noted that, far from providing any sound appreciation of the purpose or effect of the patent system, the various economic constructs are all lacking in certain aspects. In particular, they all appeared to be theoretical without practical applicability, based, as they are, on a small number of non-randomly selected cases. Therefore, by the end of Part I of the thesis we had effectively concluded that the patent system operates as a commercial tool and thus primarily finds justification based on maintenance of the *status quo*. This is not to say that the other theories play no part in the provision of patent protection, but rather that once a system is in operation it is actually impossible to say whether it operates to the net benefit or detriment of the State. Therefore, the question of scope ceases to be one of finding the 'best' level of protection given the justification of the grant, and moves to be more a matter of personal choice, based on what best suits the current technological standing of the nation. This conclusion is reinforced when we consider the determination of scope in various States in Part II of the thesis. Therefore, we begin to see that the 'one size fits all' approach of harmonisation, in which developing countries have developed states' IP systems imposed upon them, lacks intellectual rigor.

In Part II, we moved to consider the manner in which a patent's scope of protection is determined in the world's three main Patent Office centres – namely the U.S., Japan and Europe (picking Germany as the state for comparison). In a far more graphic manner than the theoretical Chapters, these comparative studies highlighted the patent cannot be viewed in isolation; it must be seen in the institutional and administrative context in which it operates. In this context the Japanese experience is particularly enlightening as it proves that significant progress can be made in the face of, or perhaps because of, narrow protection. The patent clusters that were prevalent in Japanese practice before reforms expanding the scope of protection often operated to the detriment of the foreign patentee. However, the process of incremental advancement that the narrow

grant made possible was one of the key factors in Japan's technological explosion. Just as early British grants encouraged importation of foreign ideas, so too the Japanese system survived on the assimilation of overseas 'pioneer' inventive effort.

In contrast, both the German and the U.S. patent systems traditionally provided rather broad protection; the latter by way of the doctrine of equivalents, and the former by utilising central definition theory and protecting the 'general inventive idea'. However, in both cases there are restrictions on the degree of latitude with which the claims are to be interpreted. In Germany, this came from the Patent Office's strict requirements for the form in which the claim was to be drafted, and in the U.S. it comes from the application of restrictive doctrines such as prosecution history estoppel. In neither case does a beneficial construction of the claims render the interpretation too uncertain for the underlying principles of the patent system to operate as long as the rules relating to construction are known.

This really is the vital point evident throughout the foregoing discussion: predictability is the key. The patent system can only achieve its desired aims and objectives, whatever they may be, if the process is transparent. Institutional practices surrounding the grant can, and do, operate to gain the maximum benefit from whatever principles are currently utilised to mark the outer bounds of protection. In Chapter IV, for example, we saw that the majority of patent attorneys interviewed in connection with this work approached the claims assuming that they would be interpreted in a literal sense. This has to be correct, as it would be negligent of them (if nothing more) to rely on a beneficial interpretation somewhere later down the line to justify cutting corners.

So Where Now?

The appeal to the House of Lords in *Kirin-Amgen* represents a 'golden opportunity' for a modification of the prevailing test of claim construction in the U.K. Indeed, in an informal discussion with a leading member of the House of Lords' panel that will preside over the case, this author was told that it was a chance to revisit all of that "*Catnic* and *Improver* stuff" in quite some detail. This statement finds support in the fact that the case is timetabled to fill a two-week session of the House of Lords in July 2004. It has not been the explicit purpose of this thesis to pre-empt that decision, but rather

to investigate some of the factors that can be seen to have influenced the shape that the current law takes and to provide suggestions for its reform.

At the time of writing, the amendments to Article 69 of the European Patent Convention and the Protocol on the Interpretation thereof agreed at the Munich Diplomatic Conference in November 2000 and adopted by the Administrative Council of the European Patent Organisation on 28th June 2001, have still to come into force. The reader will recall that the revised text makes explicit reference to obvious equivalents falling with a patent's scope of protection.

The British approach to claim interpretation is currently at a junction that could take it away from its narrow roots or lead it back whence it came. Under the guise of reliance on *Catnic* the test has been modified in recent decisions of the Court of Appeal so that it is in broad conformity with the new text in all but one aspect, namely the date at which infringement is to be assessed. There are strong arguments in favour of taking the bold step of anticipating the passage of the Amendments to the EPC, but the Court must be careful to make its test clear so that the problems associated with the *Catnic* decision are not re-enacted. The time has therefore come to move to the fore in the benevolent interpretation of patent claims, to take to the helm and to steer European practice. It is time to enter the 'Era of Intellectual Creation' as leader, and to leave past restrictive practices firmly behind.

Appendix A

Matthew Fisher
Department of Law
University of Bristol
Wills Memorial Building
Queens Road
Bristol. BS8 1RJ

DATE

Dear Sir/Madam,

I am currently studying for the degree of PhD at the University of Bristol. The theme of my research is the interpretation of patent claims. To complement a traditional examination of the way in which the courts interpret patent documentation in this, and other, jurisdictions, I am conducting an empirical exploration of the claim drafting process, from initial idea to (possible) litigation.

Existing studies on this topic, of which there are precious few, place disproportionate emphasis on the results of litigation and fail to fully appreciate the impact that other actors have on the interpretation of patent claims. It is my firm belief that the judicial treatment of patent documentation cannot be isolated in this way, my study is therefore an attempt to rectify this popular failure and to promote further debate on this important topic.

An integral part of this research involves an investigation into the philosophy of claim drafting, specifically:

- To what extent is claim drafting judicially, or institutionally, led, if at all?
- What thought processes are associated with the drafting of the patent? For instance:
    - Do inventive step or issues of novelty and prior art take precedence when drafting a claim?
    - Are different expectations and therefore procedures applicable when drafting claims for the European Patent Office as opposed to the UK Patent Office?
    - Does the possibility and probability of litigation influence drafting style?
- Does the industrial category that the invention falls into *affect a conceptual variation in* drafting style and philosophy?
- Is reliance upon the precise wording of the claims the best way to protect the invention, or would recourse to a system of functional equivalents be preferable? If so, would the adoption of such a system of interpretation facilitate a change in drafting style? To this end, the perceived impact that the proposed changes to Article 69 of the EPC and the Protocol attached thereto will have on drafting procedure will be assessed.

In pursuance of this objective, I therefore wish to speak some of the actors whose input to the patent process moulds the final interpretation of the claims. I am therefore writing to ask if it would be possible to conduct a short interview covering the areas of interest highlighted above - preferably in person, however if this is inconvenient then a telephone interview arranged for a mutually convenient time would make a satisfactory substitute. It will, of course, be completely confidential discussion (individuals and firms will be made totally unidentifiable). Please indicate your willingness to assist me in this study by completing the attached pro-forma and returning it in the envelope provided.

Thank you for taking the time to read this letter, your continued co operation in this study would be much appreciated.

Yours faithfully,

Matthew Fisher.

Appendix B

Preliminary Postal Questionnaire.

Firm (please print): _____

Name and position in firm of person completing this form: (please print) _____

Contact number: _____

1). **Number of Partners in the office to which this letter has been sent – to be used for descriptive purposes only:**

2). **Number of Fee Earners in the office to which this letter has been sent - to be used for descriptive purposes only:**

3). **Number of offices – to be used for descriptive purposes only (please circle):**

1 **2-3** **4-5** **6+**

4). **For the future, are you the person whom I should first approach if seeking to interview members of your firm on the subject of claim drafting? If you are not the person, whom should be approached? (please print)**

5). **Which, if any, of the following areas of technology is a specialisation of the person whom I should contact? (please tick any that apply)**

Mechanical Engineering	☐
Electrical Engineering	☐
General Chemical	☐
Pharmaceutical	☐
Biotechnological	☐
Computer Software	☐

Thank you very much for your help.

Bibliography

Articles

Abramowitz, *Resource and Output Trends in the United States Since 1870*, (1956) 46 American Economic Review 5.

Abramowicz, *Perfecting Patent Prizes*, (2003) 56 Vanderbilt Law Review 115.

Adamo, *The Waiting at the (Patent) Bar is Over - The Supreme Court Decides Hilton Davis*, (1997) 79 JPTOS 431.

Adams & Averley, *The Patent Specification – The Role of Liardet v Johnson*, (1986) 7 J. Leg. Hist. 156.

Adelman, *Property Rights Theory and Patent Antitrust: The Role of Compulsory Licensing*, (1977) 52 New York University Law Review 977.

Adelman & Francione, *The Doctrine of Equivalents in Patent Law: Questions that Pennwalt did not Answer*, (1989) 137 University of Pennsylvania Law Review 673.

Allison & Lemley, *Who's Patenting What? An Economic Exploration of Patent Prosecution*, (2000) 53 Vanderbilt Law Review 2099.

Allison & Lemley, *The Growing Complexity of the United States Patent System*, (2002) 82 Boston University Law Review 77.

Allison & Lemley, *Who's Patenting What? An Economic Exploration of Patent Prosecution*, (2000) 53 Vanderbilt Law Review 2099.

Annand, *Infringement of Patents - Is "Catinc" the Correct Approach for Determining The Scope of a Patent Monopoly under the Patents Act 1977?* [1992] Anglo American Law Review 39.

Arai, *The Facts Behind Japan's Technology Explosion*, (2000) (May) MIP 19.

Armitage, *Drafting and Interpretation of Claims Under New European Patent Laws: A review of the Benescience Conference in May 1981*, (1981) 12 IIC 627.

Armitage, *Interpretation of European Patents (Art 69 EPC and the Protocol on the Interpretation)*, (1983) 14 IIC 811.

Armstrong, *From the Fetishism of Commodities to the Regulated Market: The Rise and Decline of Property*, (1987) 82 Northwestern University Law Review 79.

Atkinson, Rose & Wasleff, *Was Festo Really Necessary?* (2001) 83 JPTOS 111.

Attridge, *Challenging Claims' Patenting Computer Programs in Europe and the USA*, [2001] IPQ 22.

Ayres & Klemperer, *Limiting Patentees' Market Power without Reducing Innovation Incentives: The Perverse Benefits of Uncertainty and Non-Injunctive Remedies*, (1999) 97 Michigan Law Review 985.

Bannerman & Hamer, *Different Approaches to the Doctrine of Equivalents in Germany, UK, US and Japan*, (2000) 25 AIPPI 82.

Bardehle, *A New Approach to Worldwide Harmonisation of Patent Law*, (1998) 29 IIC 876.

Barton, *Non-Obviousness*, (2003) 43 IDEA 475.

Batzel, *Legal Monopoly in Liberal England: The Patent Controversy in the Mid-Nineteenth Century*, [1980] Business History 189.

Baum, *The Federal Courts and Patent Validity: An Analysis of the Record*, (1974) 56 JPOS 758.

Baxter, *Legal restrictions on the Exploitation of the Patent Monopoly: An Economic Analysis*, (1966) 76 Yale L J 267.

Beck, *The Prospect Theory of The Patent System and Unproductive Competition*, (1983) 5 Research in Law and Economics 193.

Beckerman-Rodau, *The Choice Between Patent Protection and Trade Secret Protection: A Legal and Business Decision*, (2002) 84 JPTOS 371.

Beier, *Future Problems of Patent Law*, (1972) 3 IIC 423.

Beier, *The Significance of the Patent System for Technical, Economic and Social Progress*, (1980) 11 IIC 563.

Beier & Straus, *The Patent System and its Informational Function - Yesterday and Today*, (1977) 8 IIC 387.

Beil, *Comment on Metronidazol*, (1976) 7 IIC 416.

Belvis, *An Analysis of the En Banc Decision in Festo Corp. v Shoketsu Kinzoku Kogyo Kabushiki Co. and the Doctrine of Equivalents*, (2002) 11 Federal Circuit Bar Journal 59.

Bender, *Clash of the Titans: The Territoriality of Patent Law vs. The European Union*, (2000) 40 IDEA 49.

Besen & Raskind, *An Introduction to the Law and Economics of Intellectual Property*, (1991) 5 Journal of Economic Perspectives 3.

Beton, *Are International Standards for Patent Claim Interpretation Possible?* [1994] EIPR 276.

Biddinger, *Limiting the Business Method Patent: A Comparison and Proposed Alignment of European, Japanese and United States Patent Law*, (2001) 69 Fordham Law Review 2523.

Blanco-White, *The Catnic Case; The Test for Infringement of a Patent*, [1981] EIPR 90.

Blanco-White, *Fifty Years in Patents*, [1987] EIPR 311.

Bodenheimer & Beton, *Infringement by Equivalents in the United States and Europe: A Comparative Analysis*, [1993] EIPR 83.

Bossung, *The Responsibility of the European Patent Office for the Extent of Protection Conferred by the European Patent*, (1991) 22 IIC 918.

Bossung, *A Union Patent Instead of the Community Patent – Developing the European Patent into an EU Patent*, (2003) 34 IIC 1.

Brändle, *Can and May Interpretation and Determination of the Extent of Protection of a European Patent in Different Countries Lead to Different Results?* (1999) 30 IIC 875.

Brazell, *Recent Developments in Patent Construction and Litigation*, [1998] IP & IT Law 4.

Brimelow, *Does Intellectual Property Need a New Set of Wheels?* [2001] EIPR 44.

Brinkhof, *The Extent of Protection Conferred by European Patents - Problems and Suggestions*, (1990) 21 IIC 489.

Brinkhof, *Some Thoughts on Equivalents*, (1991) 22 IIC 908.

Brinkhof, *The Desirability, Necessity and Feasibility of Co-operation Between Courts in the Field of European Patent Law*, [1997] EIPR 226.

Brinkhof, *Is there a European Doctrine of Equivalence?* (2002) 33 IIC 911.

Bruchhausen, *The Scope of Patent Protection in Different European Countries - An Outline of Recent Case Law*, (1973) 4 IIC 306.

Bruchhausen, *The Extent of Protection of the European Patent*, (1974) 5 IIC 253.

Bruchhausen, *Determining Patent Subject Matter in Grant, Infringement and Revocation Proceedings*, (1989) 20 IIC 341.

Carrier, *Unravelling the Patent-Antitrust Paradox*, (2002) 150 University of Pennsylvania Law Review 761.

Carvalho, *The Primary Function of Patents*, [2001] Journal of Law, Technology and Policy 25.

Cataldo, *From the European Patent to a Community Patent*, (2002) 8 Columbia Journal of European Law 19.

Chambers, *Patent Eligibility of Biotechnological Inventions in the United States, Europe, and Japan: How much Patent Policy is Public Policy?*, (2002) 34 George Washington International Law Review 223.

Chandler, *Prosecution History Estoppel, the Doctrine of Equivalents, and the Scope of Patents*, (2000) 13 Harvard Journal of Law & Technology 465.

Chism, *The Interpretation of Patent Claims Revisited: Lessons from the Experience in The United States of America for the New Harmonization Debate*, [1988] Industrial Property 40.

Cohen, *To Innovate or not to Innovate, that is the Question: The Functions, Failures, and Foibles of the Reward Function Theory of Patent Law in Relation to Computer Software Platforms*, (1999) 5 Michigan Telecommunications & Technology Law Review 1.

Cohen & Lemley, *Patent Scope and Innovation in the Software Industry*, (2001) 89 California Law Review 1.

Cole, *Patent Infringement – 'Pith and Marrow' – A Review of United Kingdom Practice*, [1980] EIPR 289.

Cole, *Letter Re: Catnic - Signpost to Where?* [1982] EIPR 184.

Cole, *Patents - Purposive Construction: Catnic Test - Use of Survey Evidence – Obviousness*, [1994] EIPR D317.

Cole, *Patents - Purposive Construction: Catnic Test - Article 69 EPC*, [1994] EIPR D318.

Cole, *Purposive Construction Under English Law - The Appeal in Daily v Berchet*, [1994] EIPR 455.

Cole, *Purposive Construction and Inventive Step - The Appeal in PLG Research v Ardon*, [1995] EIPR 147.

Cole, *Kastner v Rizla*, [1996] EIPR 110.

Cole, *Kastner v Rizla - A Historic Decision on Equivalents?* [1997] EIPR 617.

Cole, *Inventive Step: Meaning of the EPO Problem and Solution Approach, and Implications for the United Kingdom: Part 1*, [1998] EIPR 214.

Cole, *Inventive Step: Meaning of the EPO Problem and Solution Approach, and Implications for the United Kingdom: Part 2*, [1998] EIPR 267.

Cole, *Catnic*, [1999] CIPA 835.

Cole, *Centralized Litigation for European Patents: New Proposals for Inclusion in the EPC Revision Package*, [2001] EIPR 219.

Colloda, *Innovation and Patents*, (1999) 21 World Patent Information 5.

Conroy, *The Construction of Claims in UK Patent Litigation - Glaverbel SA v British Coal*, [1995] EIPR 199.

Cooper, *Making Inventions Patent*, (1991) 32 Technology & Culture 837.

Cornish & Llewelyn, *The Enforcement of Patents in the United Kingdom*, (2000) 31 IIC 627.

Curci, *Protecting Your Intellectual Property Rights Overseas*, (2002) 15 Transnational Lawyer 15.

Czmus, *Biotechnology Protection in Japan, The European Community, and the United States*, (1994) 8 Temple International & Comparative Law Journal 435.

Dam, *The Economic Underpinnings of Patent Law*, (1994) 23 Journal of Legal Studies 247.

Davies, *Further Light on the Case of Monopolies*, (1932) 48 LQR 394.

Davies, *The Early History of the Patent Specification*, (1934) 50 LQR 86.

Davies, *The Early History of the Patent Specification (continued)*, (1934) 50 LQR 260.

Davies, *Acontius, Champion of Toleration, and the Patent System*, (1936) 7 Economic History Review 63.

Dawson, *Matchmaking in the Realm of Patents: A Call for the Marriage of Patent Theory and Claim Construction Procedure*, (2001) 79 Texas Law Review 1257.

Demsetz, *Towards a Theory of Property Rights*, (1967) 57 American Economic Review 347.

Di Cerbo, *The Scope of Protection Conferred by a Product Patent*, (1991) 22 IIC 993.

Duffy, *On Improving the Legal Process of Claim Interpretation: Administrative Alternatives*, (2000) 2 Washington University Journal of Law and Policy 109.

Dunham, *Drafting Patent Claims*, (1947) 29 JPOS 318.

Dunlop, *Court of Appeal gets to Grips with the Protocol*, [2003] EIPR 342.

Eisenberg, *Analyze This: A Law and Economics Agenda for the Patent System*, (2000) 53 Vanderbilt Law Review 2081.

Engel, *The "Wortsinn" of Patent Claims in German Case Law on Patent Infringement Disputes*, (2003) 34 IIC 233.

Falconer, *The Determination of Subject-matter Protected by a Patent in Grant, Infringement and Revocation Proceedings*, (1989) 20 IIC 348.

Federico, *Origin and Early History of Patents*, (1929) 11 JPOS 292.

Feinberg, *The Expressive Function of Punishment*, (1965) 49 The Monist 397.

Fisher, *Commercial Trends and Policy in Sixteenth Century England*, (1940) 10 Econ Hist Rev 95.

Ford, *Functional Claims*, (1985) 16 IIC 325.

Franzosi, *In Defence of Catnic – Letter*, [2000] EIPR 242.

Franzosi, *Three European Cases on Equivalence – Will Europe Adopt Catnic?* (2001) 32 IIC 113.

Frumkin, *The Origin of Patents*, (1945) 27 JPOS 143.

Frumkin, *Early History of Patents for Invention*, (1947) 26 Trans. Newcomen Soc. 47.

Gall, *Legislative and Judicial Powers in Europe – Harmonizing European Patent Law*, (1988) (May) Patent World 18.

Gardiner, *Language and the Law of Patents*, [1994] CLP 255.

Geissler, *Casenote and Comment on Formstein*, (1987) 18 IIC 795.

Getz, *History of the Patentee's Obligations in Great Britain*, (1964) 46 JPOS 62.

Getz, *History of the Patentee's Obligations in Great Britain (continued)*, (1964) 46 JPOS 214.

Gilbert & Shapiro, *Optimal Patent Length and Breadth*, (1990) 21 RAND Journal of Economics 106.

Gillis, *Settling of Patent Litigation*, (2000) 606 Practising Law Institute Patents, Copyrights, Trademarks, and Literary Property Course Handbook Series 177.

Gomme, *Patent Practice in the Eighteenth Century*, (1937) 19 JPOS 256.

Grady & Alexander, *Patent Law and Rent Dissipation*, (1992) 78 Virginia Law Review 305.

Grabinski, *Can and May Determination of the Extent of Protection Conferred by a European Patent in Different Countries Lead to Different Results?* (1999) 30 IIC 855.

Graham, *The Patents Court in the United Kingdom*, (1980) 11 IIC 585.

Greenwood, *Interpretation of Patent Claims in Infringement Proceedings in Australia*, [1987] EIPR 372.

Hantman, *Doctrine of Equivalents*, (1988) 70 JPTOS 511.

Harris, *Competition Law and Patent Protection in Japan: A Half-Century of Progress, A New Millennium of Challenges*, (2002) 16 Colombia Journal of Asian Law 71.

Hauhart, *The Origin and Development of the British and American Patent and Copyright Laws*, (1983) 8 Whittier Law Review 539.

Hayashi, *Comparative Study on Patent Systems between US and Japan – 1987 and 1993 Revisions in Japan*, (1995) 20(4) AIPPI Journal 171.

Heath, *Enforcement of Patent Rights in Japan* (2000) 31 IIC 749.

Hoffman & Oliver, *The Doctrine of Equivalents Goes Back to its Roots (with a View to the Future)*, [1996] EIPR 103.

Hopkins, *When a Lack of Equivalence can still be Equivalent - Litigating Infringement of Means-Plus-Function Claims*, (2000) 40 IDEA 581.

Hosteny, *Does Festo Change Patent Prosecution?* [2001] (May) IP Today 44.

Hulme, *The History of the Patent System under the Prerogative and at Common Law*, (1896) 12 LQR 141.

Hulme, *On the Consideration of the Patent Grant, Past and Present*, (1897) 13 LQR 313.

Hulme, *The History of the Patent System under the Prerogative and at Common Law – A Sequel*, (1900) 16 LQR 44.

Hulme, *On the History of the Patent Law in the Seventeenth and Eighteenth Centuries*, (1902) 18 LQR 280.

Hulme, *The Early History of the English Patent System*, (1909) 3 AALH 117.

Hulme, *Privy Council Law and Practice of Letters Patent for Invention from the Restoration to 1794*, (1917) 33 LQR 63.

Hulme, *Privy Council Law and Practice of Letters Patent for Invention from the Restoration to 1794 (continued)*, (1917) 33 LQR 180.

Irvine & Thorne, *Construction of Claims in the UK and the EPC*, [1995] MIP (Pat Yr Book) 84.

Isayama, *Japan's Views on a Desirable IP System for the Global Economy*, (1999) 2 Journal of World Intellectual Property 679.

Jacob, *Correspondence Concerning Narrowness of Claim*, [1999] EIPR 40.

Jacob, *The Herchel Smith Lecture 1993*, [1993] EIPR 312.

Jacob, *Industrial Property - Industry's Enemy?* [1997] IPQ 3.

Jacob, *The Harmonisation of Patent Litigation*, [1997] IPQ 142.

Jacob & Tappin, *United Kingdom Patent Law*, [1993] MIP (Pat Yr Book) 24.

James, *Ensuring Broad Claim Coverage After Festo*, (2001) 18 Comp & Internet Law 13.

Janicke, *Do We Really Need So Many Mental and Emotional States in United States Patent Law?* (2000) 8 Texas Intellectual Property Law Journal 279.

Janicke, *To be or not to be: The Long Gestation of the U.S. Court of Appeals for the Federal Circuit*, (2002) 69 Antitrust Law Journal 645.

Jarratt, *English Patent System*, (1944) 26 JPOS 761.

Jessup, *The Doctrine of Equivalents*, (1972) 54 JPOS 248.

Kai, *Fostering Cumulative Innovation in the Biopharmaceutical Industry: The Role of Patents and Antitrust*, (2001) 16 Berkeley Technology Law Journal 813.

Kaplow, *The Patent-Antitrust Intersection: A Reappraisal*, (1984) 97 Harvard Law Review 1813.

Karet, *Priority and Sufficiency, Inventions and Obviousness. UK Court of Appeal Decision in Biogen v Medeva*, [1995] EIPR 42.

Karet, *Over-broad Patent Claims: An Inventive Step by the EPO*, [1996] EIPR 561.

Karet, *Delivering the Goods? The House of Lords' Decision in Biogen v Medeva*, [1997] EIPR 21.

Karet, *Analysis: English Courts and the EPO: What Next?* [1997] IPQ 244.

Karet & Watson, *Questions About Patent Construction - Auchincloss v Agricultural & Veterinary Supplies*, [1998] EIPR 192.

Kastriner, *The Revival of Confidence in the Patent System*, (1991) 73 JPTOS 5.

Kemp, *The Interpretation of Patent Claims in Relation to the Proposed European Patent System*, [1963] Industrial Property 243.

Kempin, *Precedent and Stare Decisis: The Critical Years, 1800 to 1850*, (1959) 3 Am J Leg Hist 28.

Kempner, *Comfort from EPILADY?* (1992) Jul/Aug MIP 4.

Kesan & Banik, *Patents as Incomplete Contracts: Aligning Incentives for R&D Investment with Incentives to Disclose Prior Art*, (2000) 2 Washington University Journal of Law and Policy 23.

Kim, *A Comparative Analysis of the Japanese Supreme Court Decision on Doctrine of Equivalents*, [2002] IPQ 18.

Kingston, *Is the United States Right about "First-to-Invent"?* [1992] EIPR 223.

Kingston, *Patent Protection for Modern Technologies*, [1997] IPQ 350.

Kitch, *The Nature and Function of the Patent System*, (1977) 20 Journal of Law & Economics 265.

Kitch, *Patents, Prospects, and Economic Surplus: A Reply*, (1980) 23 Journal of Law and Economics 205.

Kitch, *Elementary and Persistent Errors in the Economic Analysis of Intellectual Property*, (2000) 53 Vanderbilt Law Review 1727.

Klemperer, *How Broad Should the Scope of Patent Protection be?* (1990) 21 RAND Journal of Economics 113.

Klitzke, *Historical Background of the English Patent Law*, (1959) 41 JPOS 615.

Ko, *An Economic Analysis of Biotechnology Patent Protection*, (1992) 102 Yale Law Journal 777.

Kondo, *Keynote Address at Symposium to Commemorate the Centennial Anniversary of Japan's Accession to the Paris Convention – Roles of the Intellectual Property Rights System in Economic Development in the Light of Japanese Economy*, (2000) 25 AIPPI 28.

Korah, *Patents and Antitrust*, [1997] IPQ 395.

Kukimoto, *The Patent Law: Chapter 3 The Patent Right*, (2001) 26 AIPPI Journal 79.

Kyle, *'But a New Button to an Old Coat': The Enactment of the Statute of Monopolies, 21 James 1 cap.3*, (1998) 19 Journal of Legal History 203.

Laddie, *National I.P. Rights: A Moribund Anachronism in a Federal Europe*, [2001] EIPR 402.

Lederer, *Equivalence of Chemical Product Patents*, [1999] 30 IIC 275.

Leith, *Revision of the EPC, The Community Patent Regulation and European Technical Judges*, [2001] EIPR 250.

Lemley, *The Economics of Improvement in Intellectual Property Law*, (1997) 75 Texas Law Review 989.

Leonard, *Proposal for a Regulation Creating a Community Patent: Towards a Workable Court System – Letter*, [2001] EIPR 264.

Lerner, *The Importance of Patent Scope: An Empirical Analysis*, (1994) 25 RAND Journal of Economics 319.

Lerner, *Patent Policy Innovations: A Clinical Examination*, (2000) 53 Vanderbilt Law Review 1841.

Letwin, *The English Common Law Concerning Monopolies*, (1954) 21 U Chi L Rev 355.

Levin, *Patents in Perspective*, (1985) 53 Antitrust Law Journal 519.

Lewis, *Collateral Estoppel as Applied to the Construction of Patent Claims (Part I)*, (2001) 83 JPTOS 851.

Libling, *The Concept of Property: Property in Intangibles*, (1978) 94 LQR 103.

Long, *Invention, Authorship, "Intellectual Property," and the Origin of Patents: Notes toward a Conceptual History*, (1991) 32 Technology & Culture 846.

Long, *Patents and Cumulative Innovation*, (2000) 2 Washington University Journal of Law and Policy 229.

Loughlan, *Patents: Breaking into the Loop*, (1998) 20 Sydney L Rev 553.

Loury, *Market Structure and Innovation*, (1979) 93 Quarterly Journal of Economics 395.

Machlup & Penrose, *The Patent Controversy in the Nineteenth Century*, (1950) 10 J Ec. Hist. 1.

MacKernan & Stern, *A Major Change in the Doctrine of Equivalents or a Damp Squib? Warner Jenkinson v Hilton Davis*, [1997] EIPR 375.

MacLeod, *The Paradoxes of Patenting: Invention and Its Diffusion in 18th and 19th Century Britain, France and North America*, (1991) 32 Technology & Culture 885.

MacLeod, *The 1690's Patents Boom: Invention or Stock Jobbing?* (1986) 39 Economic History Review 549.

MacLeod, *Accident or Design? George Ravenscroft's Patent and the Invention of Lead Crystal Glass*, (1987) 28 Tech & Culture 776.

Maloney, *The Enforcement of Patent Rights in the United States*, (2000) 31 IIC 723.

Mandich, *Venetian Patents*, (1948) 30 JPOS 166.

Mandich, *Venetian Origins of Inventors' Rights*, (1960) 42 JPOS 378.

Mansfield, Schwartz and Wagner, *Imitation Costs and Patents: An Empirical Study*, (1981) 21 Economic Journal 907.

Markey, *Some Patent Problems II: Philosophical, Philological, and Procedural*, [1979] Intellectual Property 3.

Marshall, *The Enforcement of Patent Rights in Germany*, (2000) 31 IIC 646.

Martin, *Reducing Anticipated Rewards from Innovation through Patients* (sic)*: Or Less is More*, (1992) 78 Virginia Law Review 351.

Maskus, *Lessons from Studying the International Economics of Intellectual Property Rights*, (2000) 53 Vanderbilt Law Review 2219.

Maskus, *Intellectual Property Rights and Economic Development*, (2000) 32 Case Western Reserve Journal of International Law 471.

Massey, *Justice Rehnquist's Theory of Property*, (1984) 93 Yale Law Journal 541.

Maurer, *An Economic Justification for the Broad Interpretation of Patentable Subject Matter*, (2001) 95 Northwestern University Law Review 1057.

McFetridge & Smith, *Patents, Prospects, and Economic Surplus: A Comment*, (1980) 23 Journal of Law & Economics 197.

McInerney, *Biotechnology: Biogen v Medeva in the House of Lords*, [1998] EIPR 14.

McManis, *Patent Law and Policy Symposium Re-Engineering Patent Law: The Challenge of New Technologies – Introduction*, (2000) 2 Washington University Journal of Law and Policy 1.

Meier-Beck, *The Latest Issues in German Patent Infringement Proceedings*, (2001) 32 IIC 505.

Meier-Beck, *Patent Claim and Feature Structure*, (2002) 33 IIC 679.

Melman, *Post Markman: Claim Construction Trends in the Federal Circuit*, (2001) 7 Richmond Journal of Law and Technology 34.

Merges, *Commercial Success and Patent Standards: Economic Perspectives on Innovation*, (1988) 76 California Law Review 803.

Merges, *Rent Control in the Patent District: Observations on the Grady-Alexander Thesis*, (1992) 78 Virginia Law Review 359.

Merges, *Uncertainty and the Standard of Patentability*, (1992) 7 High Technology Law Journal 1.

Merges, *Intellectual Property Rights and Bargaining Breakdown: The Case of Blocking Patents*, (1994) 62 Tennessee Law Review 75.

Merges, *Intellectual Property Rights and the New Institutional Economics*, (2000) 53 Vanderbilt Law Review 1857.

Merges & Nelson, *On the Complex Economics of Patent Scope*, (1990) 90 Colombia Law Review 839.

Merges & Reynolds, *The Proper Scope of the Copyright and Patent Power*, (2000) 37 Harvard Journal on Legislation 45.

Meshbesher, *The Role of History in Comparative Patent Law*, (1996) 78 JPTOS 594.

Michel, *The Role and Responsibility of Patent Attorneys in Improving the Doctrine of Equivalents*, (2000) 40 IDEA 123.

Micklethwait, *Brushing up our Drafting*, [1946] CIPA J 71.

Mills, *A Transnational Patent Convention for the Acquisition and Enforcement of International Rights*, (2002) 84 JPTOS 83.

MIP, *Patenting Frenzy: 3Com*, (1999) 85 MIP 26.

Mizumoto, *Translation of a Supreme Court Decision on the Doctrine of Equivalents*, (1998) 23 AIPPI 47.

Moore, *A General Period of Grace in a First to File World: Key Issues*, [2002] IPQ 75.

Mossinghoff & Kuo, *World Patent System Circa 20XX, A.D.* (1998) 38 IDEA 529.

Mossoff, *Rethinking the Development of Patents: An Intellectual History, 1550 – 1800*; (2001) 52 Hastings Law Journal 1255.

Mostert, *The Development of the Natural Law Principle as one of the Principles Underlying the Recognition of Intellectual Property*, (1987) 104 South African Law Journal 480.

Newberg, *Technology Licensing Under Japanese Antitrust Law*, (2001) 32 Law and Policy in International Business 705.

Nicolai, *First-to-File vs. First-to-Invent: A Comparative Study Based on German and United States Patent Law* (1972) 3 IIC 103.

Noonan, *Understanding Patent Scope*, (1986) 65 Oregon Law Review 717.

Norman, *Patent Law Revision: Some Economic Considerations*, (1984) 12 Australian Business Law Review 226.

Norman H.E., *Determining the Scope of the Patentee's Monopoly: Purposive Construction Revisited*, [1998] Anglo-American Law Review 221.

Nurton, *Seconds Out, Round Two - Biotech Litigation*, (2000) 96 MIP 32.

Oakes, *"Property Rights" in Constitutional Analysis Today*, (1981) 56 Washington Law Review 583.

Oddi, *Beyond Obviousness: Invention Protection in the Twenty-First Century*, (1989) 38 American University Law Review 1097.

Oddi, *Un-Unified Economic Theories of Patents – The Not-Quite-Holy Grail*, (1996) 71 Notre Dame Law Review 267.

Oliver, *Kastner v Rizla - Too Far, Too Fast*, [1996] EIPR 28.

Ooya, *Genentech Inc. v Sumimoto Pharmaceuticals Co., Ltd. Osaka High Court Decision, March 29, 1996*, (1996) 21 AIPPI 107.

Oppenheim, *Robert Andrew Macfie, Patents, Copyright, Libraries and Legal Deposit*, [1998] IPQ 383.

Ordover, *Economic Foundations and Considerations in Protecting Industrial and Intellectual Property*, (1985) 53 Antitrust Law Journal 503.

Ordover, *A Patent System for both Diffusion and Exclusion*, (1991) 5 Journal of Economic Perspectives 43.

Pagenberg, *New Trends in Patent Claim Interpretation in Germany - Good-bye to the "General Inventive Idea"*, (1988) 19 IIC 788.

Pagenberg, *The Scope of Article 69 European Patent Convention: Should Sub-Combinations be Protected? - A Comparative Analysis on the Basis of French and German Law*, (1993) 24 IIC 314.

Pagenberg, *More Refined Rules of Claim Interpretation in Germany - Are They Necessary?* (1995) 26 IIC 228.

Pagenberg, *Twenty-Five Years of Patent Law in IIC*, (1995) 26 IIC 752.

Pagenberg, *The First Instance European Patent Court - A Tribunal without Judges and Attorneys?* (2000) 31 IIC 481.

Palmer, *Are Patents and Copyrights Morally Justified? The Philosophy of Property Rights and Ideal Objects*, (1990) 13 Harvard Journal of Law and Public Policy 817.

Parchomovsky, *Publish or Perish*, (2000) 98 Michigan Law Review 926.

Pegram, *Should there be a U.S. Trial Court with a Specialization in Patent Litigation?* (2000) 82 JPTOS 766.

Pendleton, *Catnic - Signpost to Where?* [1982] EIPR 79.

Pendleton, *The Purposive Approach to Patent Construction: A Divergence in Anglo-Australian Judicial Interpretation*, [1983] 14 Melbourne University Law Review 75.

Pendleton, *A Defense of Purposive Construction – Letter*, [2000] EIPR 342.

Perry & Krishna, *Making Sense of Mouse Tales: Canada Life Form Patents Topsy Turvy*, [2001] EIPR 196.

Phillips, *The English Patent as a Reward for Invention: The Importation of an Idea*, (1982) 3 Journal of Legal History 71.

Pitlick, *Looking Beyond Blazemarks on Trees – It's Time to Revisit the Description requirement in the Wake of Warner-Jenkinson*, (1997) 79 JPTOS 625.

Plant, *The Economic Theory Concerning Patents for Invention*, (1934) 1 NS Economica 30.

Player, *Elemental Equivalence: Interpreting 'Substantially the Same Way' under Pennwalt – Taken in Light of Corning Glass*, [1989] EIPR 421.

Pohlmann, *The Inventor's Right in Early German Law*, (1961) 43 JPOS 121.

Polk & Spivey, *Patent Law Basics: Understanding the United States Patent System*, (2001) 15 (Apr) NBA National Bar Assoc. Mag 16.

Port, *Japanese Intellectual Property Law in Translation: Representative Cases and Commentary*, (2001) 34 Vanderbilt Journal of Transnational Law 847.

Port, *The Spirit of Japanese Law (Book Review)*, (2002) 1 Washington University Global Studies Law Review 573.

Prager, *A History of Intellectual Property 1545 to 1787*, (1944) 26 JPOS 711.

Prager, *The Early Growth and Influence of Intellectual Property*, (1952) 34 JPOS 106.

Prager, *The changing views of Justice Story on the Construction of Patents*, (1960) 4 American Journal of Legal History 14.

Prager, *Trends and Developments in American Patent Law from Jefferson to Clifford (1790-1860)*, (1962) 6 Amercian Journal of Legal History 47.

Prager, *Examination of Inventions from the Middle Ages to 1836*, (1964) 46 JPOS 268.

Prakash-Canjels, *Trends in Patent Cases: 1990 – 2000*, (2001) 41 IDEA 283.

Radack, *Reading and Understanding Patent Claims*, (1995) 47 JOM 69.

Rahn, *The Role of Industrial Property in Economic Development: The Japanese Experience*, (1983) 14 IIC 449.

Rai, *Fostering Cumulative Innovation in the Biopharmaceutical Industry: The Role of Patents and Antitrust*, (2001) 16 Berkeley Technology Law Journal 813.

Reichman, *From Free Riders to Fair Followers: Global Competition under the TRIPS Agreement*, (1997) 29 New York University Journal of International Law and Politics 11.

Reid, *Infringement under the UK Patents Act; The New Commandments*, [1980] EIPR 393.

Reid, *The Catnic Decision: Construction of Patent Claims*, [1981] EIPR 56.

Reid, *Catnic Revisited*, [1996] CIPA J 88.

Reiman & Köhler, *International Litigation: Focus on Germany*, [2003] (January) IP Litigator 18.

Rich, *Extent of Protection and Interpretation of Claims - American Perspectives*, (1990) 21 IIC 497.

Rich, *Are Letters Patent Grants of Monopoly?* (1993) 15 Western New England Law Review 239.

Rich, *My Favorite Things*, (1994) 35 IDEA 1.

Rigamonti, *Conflicting Theories of Equivalence: 35 U.S.C. s112 ss6 in the Supreme Court and the Federal Circuit*, (2000) 40 IDEA 163.

Roberts, *Broad Claims for Biotechnological Inventions*, [1994] EIPR 371.

Roberts, *Paper, Scissors, Stone*, [1998] EIPR 89.

Rogers, *On the Rationale and Working of the Patent Laws*, (1863) 26(2) Journal of the Statistical Society of London 121.

Romary & Michelsohn, *Patent Claim interpretation after Markman: How the Federal Circuit Interprets Claims*, (1997) 46 American University Law Review 1887.

Rose, *Patent "Monopolyphobia": A Means of Extinguishing the Fountainhead*, (1999) 49 Case Western Reserve Law Review 509.

Rosen & Usui, *The Social Structure of Japanese Intellectual Property Law*, (1994) 13 UCLA Pacific Basin Law Journal 32.

Sankaran, *Patent Flooding in the United States and Japan*, (2000) 40 IDEA 393.

Sato, *Strengthening the Protection of Intellectual Property Rights to Meet the Needs of the 21st Century – Future Policy on Intellectual Property Rights*, (2001) 26(4) AIPPI Journal 199.

Schaafsma, *An Economic Overview of Patents*, (1997) 79 JPTOS 241.

Schankerman, *How Valuable is Patent Protection? Estimates by Technology Field*, (1998) 29 RAND Journal of Economics 77.

Scherer, *Comment on Edmund Kitch*, (1986) 8 Research in Law and Economics 51.

Scherer, *The Pharmaceutical Industry and World Intellectual Property Standards*, (2000) 53 Vanderbilt Law Review 2245.

Schwarz, *Claim Interpretation in US Patent Litigation - The US Supreme Court's Decision in Markman v Westview Instruments*, [1996] EIPR 502.

Scotchmer, *Standing on the Shoulders of Giants: Cumulative Research and Patent Law*, (1991) 5 Journal of Economic Perspectives 29.

Scotchmer & Green, *Novelty and Disclosure in Patent Law*, (1990) 21 RAND Journal of Economics 131.

Sears, *Patent Claim Interpretation: A Question of Law, not Fact*, [1998] MIP (Pat Yr Book) 58.

Sears, *Importance of the Written Description in U.S. Patent Claims*, [2000] MIP (Pat Yr Book) 38.

Sears, *Supreme Court Reviews Patent Scope and Meaning*, [1997] MIP (Pat Yr Book) 49.

Sedemund-Treiber, *Report on Recent Jurisprudence in Germany*, (1997) 28 IIC 884.

Sherman, *Patent Claim Interpretation: The Impact of the Protocol on Interpretation*, (1991) 54 MLR 499.

Sijp, *Scope of Protection Afforded by a European Patent*, [1979] 10 IIC 433.

Singer, *Infringement of Supranational Patent Rights in a Future Europe*, [1972-3] Industrial Property 380.

Solow, *Technical Change and the Aggregate Production Function*, (1957) 39 Review of Economics and Statistics 312.

Stauder, *The Practical Significance of Infringement and Revocation Proceedings in the Federal Republic of Germany, France, Italy and the United Kingdom. Results of a Statistical and Empirical Study*, (1983) 14 IIC 793.

Staughton, *How do the Courts Interpret Commercial Contracts?* (1999) 58 Cambridge Law Journal 303.

Stenvik, *Protection for Equivalents Under Patent Law – Theories and Practice*, (2001) 32 IIC 1.

Stevens, *Basic Concepts and Current Differences in English and American Law*, (1984) 5 Journal of Legal History 336.

Steyn, *The Stauffer Chemical Company Case: 'Purposive Construction' in South African Patent Law*, [1986] EIPR 354.

Straus, *Patent Litigation in Europe – A Glimmer Of Hope? Present Status and Future Perspectives*, (2000) 2 Washington University Journal of Law and Policy 403.

Sutton & Darrow, *Recent Developments in Patent Law*, (2001) 9 Texas Intellectual Property Law Journal 429.

Takenaka, *The Role of the Japanese Patent System in Japanese Industry*, (1994) 13 UCLA Pacific Basin Law Journal 25.

Takenaka, *International and Comparative Law Perspectives on Internet Patents*, (2001) 7 Michigan Telecommunications and Technology Law Review 423.

Takura, *Japanese Claim Interpretation*, (1994) 19(5) AIPPI Journal 215.

Tani, *THK Co. v Tsubakimoto Seiko Co. – Infringement Case for Ball Spline Bearing*, (1998) 1(6) Journal of World Intellectual Property 963.

Tessensohn, *Japan: Patents: USPTO, JPO and EPO Comparison – Patentability of Business Methods*, [2001] EIPR N15.

Thorne, *John Utynam's Patent A.D. 1449 and Medieval Common Law and Other Considerations of Related Interest*, (1957) 27 Canadian Pat Rep 21.

Truman-Wood, *The Patents for Inventions Bill 1877*, (1877) 25 Journal of the Society of the Arts 342.

Turner. B., *The German Formstein Case: An Alternative Harmony*, [1992] EIPR 181.

Turner. D., *The Patent System and Competitive Policy*, (1969) 44 New York University Law Review 451.

Turner. D., *Basic Principles in Formulating Antitrust and Misuse Constraints on the Exploitation of Intellectual Property Rights*, (1985) 53 Antitrust Law Journal 485.

Turner. J., *Purposive Construction - Seven Reasons why Catnic is Wrong*, [1999] CIPA J 700.

Turner. J , *Purposive Construction – Letter*, [2001] EIPR 118.

Usher, *The Welfare Effects of Invention*, (1964) 31 Econometrica 279.

Van Engelen, *The Unites States Supreme Court on the Doctrine of Equivalence in Warner Jenkinson v Hilton Davis: An Inspiration for Europe?* [1998] IPQ 149.

Vojáček, *Back to Queen Elizabeth*, (1950) 32 JPOS 629.

Vukmir, *The Roots of Anglo-American Intellectual Property Law in Roman Law*, (1992) 32 IDEA 123.

Wagner, *Coke and the Rise of Economic Liberalism*, (1935) 6 Economic History Review 30.

Walterscheid, *The Early Evolution of the United States Patent Law: Antecedents (Part 1)*, (1994) 76 JPTOS 697.

Walterscheid, *The Early Evolution of the United States Patent Law: Antecedents (Part 2)*, (1994) 76 JPTOS 849.

Walterscheid, *The Early Evolution of the United States Patent Law: Antecedents (Part 3)*, (1995) 77 JPTOS 771.

Walterscheid, *The Early Evolution of the United States Patent Law: Antecedents (Part 3 Cont.)*, (1995) 77 JPTOS 847.

Walterscheid, *The Early Evolution of the United States Patent Law: Antecedents (Part 4)*, (1996) 78 JPTOS 77.

Walterscheid, *The Early Evolution of the United States Patent Law: Antecedents (5 Part I)*, (1996) 78 JPTOS 615.

Walterscheid, *The Early Evolution of the United States Patent Law: Antecedents (5 Part II)* (1996) 78 JPTOS 665.

Walterscheid, *To Promote the Progression of Useful Arts: American Patent Law and Administration 1787-1836 (part 1)*, (1997) 79 JPTOS 61.

Walterscheid, *To Promote the Progression of Useful Arts: American Patent Law and Administration 1787-1836 (part 2)*, (1998) 80 JPTOS 11.

Walterscheid, *Patents and Manufacturing in the Early Republic*, (1998) 80 JPTOS 855.

Walterscheid, *The Remarkable - and Irrational - Disparity between the Patent Term and the Copyright Term*, (2001) 83 JPTOS 233.

Walton, *Purposive Construction*, [1984] EIPR 93.

Wegner, *Festering Questions After Festo*, (2003) 13 Fordham Intellectual Property, Media and Entertainment Law Journal 891.

Wepner, *The Patent Invalidity/Infringement Parallel: Symmetry or Semantics?* (1988) 93 Dickinson Law Review 67.

Weston, *A Comparative Analysis of the Doctrine of Equivalents: Can European Approaches solve an American Dilemma?* (1998) 39 IDEA 35.

Wharton, *Festo and the Complete Bar: What's left of the Doctrine of Equivalents?* (2001) 20 Saint Louis University Public Law Review 281.

White, *The Function and Structure of Patent Claims*, [1993] EIPR 243.

Wibbelmann, *Broad Claims: A Nuisance?* [1997] EIPR 515.

Williams, *Language and The Law (Part IV)*, (1945) 61 LQR 384.

Willems, *Awaiting the Community Patent – A Suggestion for a Flexible Interim Solution*, (2002) 33 IIC 561.

Winkler, *The Scope of Patent Protection: Past, Present and Future*, (1979) 10 IIC 296.

Wyatt, *Limitation to the Doctrine of Equivalents and Recent Cases Since Warner-Jenkinson*, (1998) 39 IDEA 81.

Yamamoto & Tessensohn, *The Born-Again Doctrine of Equivalents in Japan: The Genentech Appeal* [1996] EIPR 572.

Yamamoto & Tessensohn, *Doctrine of Equivalents Breakthrough in Japan*, (1996) (Jul/Aug) MIP 12.

Yamamoto & Tessensohn, *Japan's Supreme Court Broadens Patent Protection*, (1998) (Apr) MIP 12.

Yamamoto & Tessensohn, *Reaping the Fruits of a Pro-Patentee Era*, (1999) (Jan) MIP 28.

Yamamoto & Tessensohn, *Doctrine of Equivalents adds Torque to Japanese Patent Infringement*, (1999) 81 JPTOS 483.

Zimmerman, *Hughes Aircraft and the Warner-Jenkinson Presumption: The Certiorari that Should have been*, (2000) 40 IDEA 131.

Zimmerman, *The Doctrine of Equivalents: A Call for Congressional Reinvigoration*, (2000) 40 IDEA 599.

Books

Arrow, *Economic Welfare and the Allocation of Resources for Invention*, in Nelson (ed.), *The Rate of Inventive Activity: Economic and Social Factors*, (1962; Princeton University Press, Princeton).

Arrow, *Welfare Economics and Inventive Activity*, in the Rate and Direction of Inventive Activity, (1962; NBER, Princeton).

The Banks Committee, *The British Patent System: Report of the Committee to Examine the Patent System and Patent Law*, (July 1970) Cmnd. 4407

Bently & Sherman, *The Making of Modern Intellectual Property Law* (1999; Cambridge University Press, Cambridge).

Black, *The Oxford Dictionary of Economics*, (1997; OUP, Oxford).

Boehm, *The British Patent System: I Administration*, (1967, Cambridge University Press, Cambridge).

Bredimas, *Methods of Interpretation and Community Law* (1978; Elsevier North-Holland, New York).

Bugbee, *The Genesis of American Patent and Copyright Law*, (1967; Public Affairs Press, Washington D.C.).

Carpmael, *The Law of Patents for Inventions, Familiarly Explained, for the use of Inventors and Patentees*, (1832; G. Wightman, London).

Coke, *Part III of the Institutes of the Laws of England*, (1817; Clarke & Sons, London; reprint).

Coulter, *Property in Ideas: The Patent Question in Mid-Victorian Britain*, (1991; Thomas Jefferson University Press, Kirksville).

Deller, *Patent Claims*, (1971; Lawyers Co-operative Publishing (Bancroft-Whitney), New York, 2nd Ed.).

Donahue, *The Future Concept of Property Predicted from its Past*, in Pennock, *Property*, (1980; New York University Press, New York).

Drahos, *A Philosophy of Intellectual Property*, (1996; Dartmouth, Aldershot (UK)).

Dutton, *The Patent System and Inventive Activity During the Industrial Revolution 1750-1852*, (1984; Manchester University Press, Manchester).

Feynman, *Surely You're Joking Mr. Feynman* (1992; Vintage, London).

Flexner, *Steamboats Come True. American Inventors in Action*, (1944; Viking Press: New York).

Fox, *Monopolies and Patents: A Study of the History and Future of the Patent Monopoly*, (1947; University of Toronto Press, Toronto).

Gomme, *Patents of Invention: Origin and Growth of the Patent System in Britain* (1946; Longmans, Green and Co., London).

Greenstreet, *History of Patents* in Liebesny (ed.), *Mainly on patents. The Use of Industrial Property and its Literature* (1972; Butterworths, London).

Grey, *The Disintegration of Property*, in Pennock (Ed.), *Property*, (1980; New York University Press, New York).

Haley, *The Spirit of Japanese Law*, (1998; University of Georgia Press, Athens, GA).

Hindmarch, *Treatise on the Law Relating to Patent Privileges for the Sole Use of Inventions*, (1846; V&R Stevens, G.S. Norton, and W. Benning & Co., London).

Holdsworth, *A History of English Law* (1932; Methuen, London, 5th Ed).

Honore, *Ownership*, in Oxford Essays in Jurisprudence, (1961; Oxford University Press, London) (A. Guest (Ed.)).

Inlow *The Patent Grant*, (1950; Johns Hopkins University Press, Baltimore).

Johnson, *The Economics of Invention and Innovation*, (1975; Martin Robertson & Co., London).

Kaufer, *The Economics of the Patent System*, in Lesourne & Sonneschein (eds.), *Fundamental of Pure and Applied Economics (series)*, (1989; Harwood Academic Publishers, New York).

Kemp (ed), *Patent Claim Drafting and Interpretation*, (1983; Oyez Longman, London).

Koestler, *The Act of Creation*, (1976, Hutchinson, London; 2nd (Danube) Ed.).

Liebenau, *The Challenge of New Technology: Innovation in British Business Since 1850*, (1988; Gower, Aldershot).

Lincoln, *Discoveries, Inventions, and Improvements* (1859) In the Complete Works of Abraham Lincoln (1905; Francis D. Tandy Co, New York; 3rd Ed.) Volume 5.

Locke, *Two Treatises of Government*, Chapter V, Book II (1993; M.Goldie, ed.; Everyman, London; Original published in 1690).

Lockwood, *The Economic Development of Japan: Growth and Structural Change (1868-1938)*, (1954; Princeton University Press, Princeton).

Macfie, *The Patent Question under Free Trade: A Solution of the Difficulties by Abolishing or Shortening the Inventor's Monopoly and Instituting National Recompenses*, (1863; W. Johnson, London; 2nd Ed).

Macfie, *Recent Discussions on the Abolition of Patents for Inventions*, (1869; Longmans, Green, Reader, & Dyer, London).

Macfie, *The Patent Question in 1875*, (1875; Longmans, Green & Co, London).

Macfie, *Cries in a Crisis for Statesmanship Popular and Patriotic to Test and Contest Free-Trade in our Manufactures*, (1881; Edward Stanford, London).

Machlup, *An Economic Review of the Patent System*, Study No. 15 of the Sub-Committee on Patents, Trademarks and Copyrights of the Committee on the Judiciary, U.S. Senate 85th Congress, 2nd Session, (1958; Washington).

MacLeod, *Inventing the Industrial Revolution: The English Patent System 1660 – 1800*, (1988; Cambridge University Press, Cambridge).

MacLeod, *Concepts of Invention and the Patent Controversy in Victorian Britain*, in Robert Fox (ed.), *Technological Change: Methods and Themes in the History of Technology*, (1996; Harwood Academic Press, Australia).

Maitland, *Domesday Book and Beyond: Three Essays in the Early History of England*, (1897; Cambridge University Press, Cambridge).

Merges, *Intellectual Property in the New Technological Age*, (1997; Aspen Law & Business, New York).

Merges: *Patent Law and Policy: Cases and Materials*, (1997; Michie, Charlottesville, Virginia; 2nd Ed.).

Mill, *Principles of Political Economy* (1929; Longmans, Green & Co., London; 2nd Ed.).

Oliver, *Law and Economics – Economics and Society Series Nº 7*, (1979; George Allen & Unwin, London).

Phillips (ed.), *Patents in Perspective: A Collection of Essays*, (1985; ESC Publishing, Oxford).

Posner, *Economic Analysis of Law*, (1992; Little, Brown and Company, Boston; 4th Ed).

Price, *The English Patents of Monopoly* (1913; Harvard University Press, Cambridge (Mass)).

Robinson, *The Law of Patents for Useful Inventions*, (1890; Little, Brown & Co., Boston).

Scherer, *Patents and the Corporation: A Report on Industrial Technology under Changing Public Policy*, (1958; J. J. Galvin, Boston).

Scherer, *Industrial Market Structure and Economic Performance*, (1980; Houghton Mifflin, Boston; 2nd Ed.).

Schmookler, *Invention and Economic Growth*, (1966; Harvard University Press, Cambridge (Mass)).

Schumpeter, *Theory of Economic Development*, (1936; Harvard University Press, Cambridge (Mass))

Schumpeter, *Capitalism, Socialism, and Democracy*, (1947; Allen & Unwin, London; 2nd Ed.).

Smith, *The Wealth of Nations* (1937; The Modern Library, New York).

Smith, *Selected Essays on Jurisprudence*, (1978; Clarendon Press, Oxford) (Meek, Raphael & Stein (Eds.)).

Spence, *A Treatise on the Principles Relating to the Specification of a Patent for Invention*, (1847; V&R Stevens, and G.S. Norton, London).

Stark, (ed), *Jeremy Bentham's Economic Writings*, (1952; George Allen & Unwin, London).

Stephen, *The Economics of the Law*, (1987; Wheatsheaf, London).

Takenaka, *Interpreting Patent Claims: The United States, Germany and Japan*, Vol. 17 Studies in Industrial Property and Copyright Law (1995; Max Planck Institute for Foreign and International Patent, Copyright and Competition Law, Munich).

Taylor & Silberston, *The Economic Impact of the Patent System*, (1973; Cambridge University Press, Cambridge).

Thorley (ed), *Terrell on the Law of Patents*, (2000; Sweet & Maxwell, London; 15th Ed).

U.S. Department of Commerce, Patent Office, *The story of the United States Patent Office*, (1972; U.S. Department of Commerce, Washington).

Veljanovsk, *The Economics of Law: An Introductory Text*, (1990; Institute of Economic Affairs, London).

Vittoria (ed), *The Patents Act 1977*, (1978; Sweet & Maxwell, London).

Vojáček, *A Survey of the Principal National Patent Systems*, (1936; Prentice Hall, New York).

Whitehead, *Science and Modern World,* (1925; Macmillan, New York).

Yamamoto (ed) *20/20 for the 21st Century: 1979-1999: A Special Twentieth Anniversary Issue of IP Japan*, (1999; Yamamoto Patent Law Offices, Osaka).

Cases Referred to in the Text

A.C. Edwards v Acme Signs & Displays Ltd., [1992] RPC 131.

Ace Denken KK v. Yuai Shoji – p.113 Hanrei Jihou (Law Report) Nº 1390 (19th July 1990).

Al-Site Corp. v VSI International Inc., 174 F.3d 1308 (1999, CAFC).

American Hoist & Derrick Co. v. Sowa & Sons, Inc., 725 F.2d 1350 (1984, CAFC).

Anchor Building Products Ltd v Redland Roof Tiles Ltd, [1990] RPC 283.

Asahi Kasei Kogyo, [1991] RPC 485.

Assidoman Multipack v The Mead Corporation [1995] RPC 321.

Bayer/Carbonless Copying T1/80 [1979-85] B EPOR 250.

Beecham Group v Bristol Laboratories, [1978] RPC 153.

Birmingham Sound Reproducers Ltd., v Collaro, [1956] RPC 232.

Biogen v Medeva, [1997] RPC 1.

British Hartford-Fairmont Syndicate Ltd v Jackson Bros (Knottingley) Ltd, (1932) 49 RPC 495.

Boulton v Bull, 2 H BL 463, 126 Eng Rep 651.

Carman Industries Inc. v Wahl, 724 F.2d 932 (1983, CAFC).

Cartwright v Eamer, unreported.

Catnic Components v Hill & Smith [1982] RPC 183.

Chiron v Organon (Nº 12) [1996] FSR 153.

Clark v Adie, (1876-7) 2 App Cas 315.

Clothworkers of Ipswich, Godbolt 252, 78 Eng Rep 147.

Connell v Sears Roebuck & Co., 722 F.2d 1542 (1983, CAFC).

Corning Glass Works v Sumitomo Electric, 868 F.2d 1251 (1989, CAFC).

Cutting Knife I, [2003] ENPR 309.

Darcy v Allin, 11 Co Rep 84b, 77 Eng Rep 1260.

Deyerle v Wright Manufacturing Co., 496 F.2d 45, (1974, United States Court of Appeals, 6th Circuit).

D.M.I. Inc. v Deere & Co., 755 F.2d 1570 (1985, CAFC).

Edison Bell Phonograph Corporation v Smith, (1894) 11 RPC 389.

E.M.I. v Lissen, (1939) 56 RPC 23.

Evans v Eaton, 16 U.S. 454 (1818, Supreme Court); also 20 U.S. 356 (1822, Supreme Court).

Exhibit Supply Co. v Ace Patents Corp., 62 S.Ct. 513 (1942, Supreme Court).

Feed Service Corp v Kent Feeds Inc., 528 F.2d 756, (1976, United States Court of Appeals, 7th Circuit).

Festo Corporation v. Shoketsu Kinzoku Kogyo Kabushiki Co, 520 U.S. 1111 (1997, Supreme Court), 535 U.S. 722 (2002, Supreme Court), 34 F.3d 558 (2000, CAFC, *en banc.*), Unreported decision of the CAFC (*en banc*) of 26th September 2003.

Formstein, (1987) 18 IIC 795.

Genentech Inc. v Sumitomo Pharmaceutical Co. Ltd. H-6 (ne) Nº 3292 (29th March, 1996)

General Dynamics Corp. v Whitcomb, 443 F.2d 630, (1971, United States Court of Appeals, 4th Circuit).

Goddin and Rennie's Application, [1996] RPC 141.

Graver Tank v Linde Air Products, 339 U.S. 605.

Gray v James, 10 F.Cas. 1015 (1817, Circuit Court for Pennsylvania).

Great Atlantic & Pac. Tea Co. v. Supermarket Equipment Corp., 340 U.S. 147 (1950, Supreme Court).

Harmer v Plane, 14 Ves. (Jun) 131.

Harrison v Anderston Foundry Co., (1875-6) 1 App Cas 574.

Hobbs v Beach, 180 U.S. 383 (1901, Supreme Court).

Hughes Aircraft Co. v United States, 717 F.2d 1351 (1983, CAFC), 215 U.S.P.Q. 787 (1982, U.S. Court of Claims).

Improver v Remington, [1989] RPC 69 (CA, Interim); [1991] FSR 181 (Patents Court).

Improver v Remington, (German Proceedings) (1993) 24 IIC 838.

Intergraph Corp. v. Intel Corp., 195 F.3d 1346 (1999, CAFC).

Kastner v Rizla, [1995] RPC 585.

Keystone Bridge Co. v Phoenix Iron Co., 95 U.S. 274 (1877, Supreme Court).

Kinzenbaw v. Deere & Co., 741 F.2d 383 (1984, CAFC).

Kirin-Amgen v Hoechst Marion Roussel, [2003] RPC 31.

KK Kouken v KK Tatsumi Ryouki. Hanrei Jiho Nº 1657, 122 (7th October, 1998).

Liardet v Johnson, (1780) 1 Y & CC 527.

Loctite Corp. v. Ultraseal Ltd., 781 F.2d 861 (1985, CAFC).

Ludlum Steel Co. v. Terry, 37 F.2d 153 (1928, Distict Court of New York).

Marconi v British Radio Telegraph and Telephone Company Ltd., (1911) 28 RPC 181.

Martin v Barber, 755 F.2d 1564 (1985, CAFC).

Medical Instrumentation and Diagnostics Corp. v. Elekta AB, [Unreported] Decision of the CAFC of 22nd September 2003.

Merrill v Yeomans, 94 U.S. 568 (1876, Supreme Court).

Mishawaka Rubber & Woolen Mfg., Co. v. S. S. Kresge Co., 316 U.S. 203 (1942, Supreme Court).

Molliped, [1974] GRUR 460.

Odiorne v Winkley, 18 F.Cas. 581 at 582 (1814, Circuit Court for Massachusetts).

O.I. Corp. v Tekmar Co, 115 F.3d 1576 (1997, CAFC).

O'Reiley v Morse, 56 U.S. 62 (1853, Circuit Court for Kentucky).

Pennwalt Corp. v Durand-Wayland Inc., 833 F.2d 931 (1987, CAFC).

Perkin-Elmer Corp. v Westinghouse Elec. Corp., 822 F.2d 1528 (1987, CAFC).

Plastic Pipes, [2003] ENPR 163.

PLG Research v Ardon International [1995] RPC 287.

Pope v Spanish River, (1928) 46 RPC 23.

R v Arkwright, (1785) 1 Web. P. C. 29.

R v G & Another (Minors), [2003] UKHL 50.

Research Corp's Supplementary Protection Certificate, [1994] RPC 387.

Rodi & Wienenberger v Showell, [1969] RPC 367.

Royal Typewriter Co. v Remington Rand, 168 F.2d 691 (1948, Circuit Court of Appeals, Second Circuit).

Safe Flight Instrument Corp. v Sunstrand Data Control Inc., 706 F.Supp. 1146 (1989, United States District Court, Delaware).

Sanitary Refrigerator Co. v Winters, 280 U.S. 30 (1929, Supreme Court).

Scanvaegt v Pelcombe, [1999] F.S.R. 786.

Schenck v Nortron Corp., 713 F.2d 782 (1983, CAFC).

Schienenschalter II [1972] GRUR 597.

Southco Inc. v Dzus Fastener Europe Ltd., [1992] RPC 299.

SS Seiyaku v Zensei Yakuhin KK, Heisei 8 (wa) 8927 (17th September, 1998).

Teva Pharmaceutical Industries Ltd. v Instituto Gentili SpA, [2003] FSR 498.

Texas Instruments Inc. v United States International Trade Commission., 805 F.2d 1558 (1986, CAFC).

THK Co. v Tsubakimoto Seiko Co. – Infringement Case for Ball Spline Bearing, 1630 Hanrei Jiho 32 (Supreme Court, 1998).

Turner v Winter, 1 TR 601, 99 English Reports 1274.

Union Carbide v BP, [1999] R.P.C. 409.

Van der Lely v Bamfords, [1963] RPC 61 (HL), [1961] RPC 296 (CA), [1960] RPC 169 (Lloyd Jacob, J)

Warheit v Olympia Tools Ltd., [2002] EWCA Civ 1161.

Warner-Jenkinson Co., Inc. v Hilton Davis Chemical Co., 520 U.S. 17 (1997, Supreme Court), 62 F.3d 1512 (1995, CAFC).

Westinghouse v Boyden Power Brake Co., 170 U.S. 537 (1898, Supreme Court).

Wheatley (Davina) v Drillsafe Ltd, [2001] RPC 133.

White v Dunbar, 119 U.S. 47 (1886, Supreme Court).

Winans v Denmead, 56 U.S. 330 (1853, Supreme Court).

Zino Davidoff v A&G Imports Limited & Tesco Stores, [2000] Ch. 127.

Web Documents (including NBER Papers and Works in Progress)

Branstetter & Nakamura, *Is Japan's Innovative Capacity in Decline?*, NBER Working Paper Nº 9438, Jan, 2003. Available online at http://papers.nber.org/papers/w9438.pdf.

Branstetter & Sakakibara, *Do Stronger Patents Induce More Innovation? Evidence from the 1998 Japanese Patent Reforms*, NBER Working Paper Nº 7066, Apr. 1999. Available online at http://www.nber.org/papers/w7066.pdf.

Cockburn, Kortum & Stern, *Are All Patent Examiners Equal? The Impact of Characteristics on Patent Statistics and Litigation Outcomes*, NBER Working Paper Nº 8980, Jun. 2002. Available online at http://www.nber.org/papers/w8980.pdf.

Cohen, Goto, Nagata, Nelson & Walsh, *R&D Spillovers, Patents and the Incentives to Innovate in Japan and the United States*, (Working Paper Jun. 2001). Available online at:

http://www.druid.dk/conferences/nw/paper1/cohen.pdf.

Cohen, Nelson & Walsh, *Appropriability Conditions and Why Firms Patent and Why they do not in the American Manufacturing Sector*, NBER Working Paper Nº 7552, Feb. 2000. Available online at http://www.nber.org/papers/w7552.pdf.

Commission on Intellectual Property Rights in the Twenty-first Century, *Toward the Era of Intellectual Creation: Challenges for Breakthrough.* (1997, Japanese Patent Office) Available online at http://www.jpo.go.jp/old/tousie/rep21eng.doc.

Encyclopaedia Britannica. "Japan"; *Encyclopædia Britannica Online.* Available online at:

http://www.search.eb.com/eb/article?eu=109537.

Endo, *Comparative Study on Prosecution History Estoppel in the U.S and Japan: What can Japan learn from the chaos in Warner-Jenkinson and Festo? (Part 1), (2002) 9 CASRIP Newsletter.* Available online at:

http://www.law.washington.edu/casrip/newsletter/newsv9i3Endo.pdf.

Endo, *Comparative Study on Prosecusion History Estoppel in the U.S and Japan: What can Japan learn from the chaos in Warner-Jenkinson and Festo? (Part 2), (2003) 10 CASRIP Newsletter.* Available online at:

http://www.law.washington.edu/casrip/newsletter/newsv10i1Endo.pdf.

Fisher, *Theories of Intellectual Property*, (1998). Available online at:

http://eon.law.harvard.edu/property/library/libtype.html.

Fukuda, *Japan Making the First Step Toward "A Nation Built on Intellectual Property", (2003) 10 CASRIP Newsletter.* Available online at:

http://www.law.washington.edu/casrip/newsletter/newsv10i1jp1.pdf.

Gallini & Scotchmer, *Intellectual Property: When is it the Best Incentive System?* May 2001. Available online at http://www.nber.org/books/innovation2/gallini5-14-01.pdf.

Girouard, *US Trade Policy and the Japanese Patent System*, BRIE Working Paper Nº 89 (August, 1996). Available online at:

http://brie.berkeley.edu/~briewww/pubs/wp/wp89.html. Link not working at 1st August 2003. GOOGLE cache version available at:

http://216.239.39.104/search?q=cache:qoHrZgGaI9sJ:www.ciaonet.org/wps/gir01/+girouard+%22Japanese+Patent+System%22&hl=en&ie=UTF-8.

Giummo, *The Effects of Patent Scope and Novelty Requirements on Cumulative Innovation when Investment is Endogenous*, (2000) Work in Progress. Available online at:

http://elsa.berkeley.edu/users/bhhall/giummo00.pdf.

Grossman & Lai, *International Protection of Intellectual Property*, NBER Working Paper Nº 8704, Jan. 2002. Available online at http://www.nber.org/papers/w8704.pdf.

Hamada, *Protection of Intellectual Property Rights in Japan*, Working Paper for the Council of Foreign Relations (April, 1996). Available online at:

http://www.ciaonet.org/wps/hki01/. Link blocked at 1st August 2003. GOOGLE cache version available at:

http://216.239.39.104/search?q=cache:EHwqfbsbT5QJ:www.ciaonet.org/wps/hki01/+%22protection+of+intellectual+property+rights+in+japan%22+hamada&hl=en&ie=UTF-8.

Harris, *The Making of an IP Nation.* Available online at:

https://www.japaninc.net/article.php?articleID=951&page=3.

Heath, *Commercialising University Inventions in Japan*, A publication of the Max Planck Institute, Munich. Available online at http://www.cmmi.gr.jp/jalo4/pdf/heath.pdf.

Heim & Chorush, *Patent Validity and Scope*, (2000). Available online at:

http://www.intprop.com/documents/pat_val_and_scope.pdf.

Jaffe, *The U.S. Patent System in Transition: Policy Innovation and the Innovation Process*, NBER Working Paper Nº 7280, Aug. 1999. Available online at:

http://www.nber.org/papers/w7280.pdf.

Japan-guide.com. http://www.japan-guide.com/e/e641.html.

Japanese Patent Office, *Trends of Industrial Property Right Applications and Registrations*, available online at http://www.jpo.go.jp/shiryou_e/trends_of_ipr.htm.

Kahn, *Intellectual Property and Economic Development: Lessons from American and European History*, Study Paper 1a of the Commission on Intellectual Property Rights. Available online at:

http://www.iprcommission.org/papers/text/study_papers/sp1a_khan_study.txt.

Kaplow & Shavell, *Economic Analysis of Law*, NBER Working Paper Nº 6960, Feb. 1999. Available online at http://www.nber.org/papers/w6960.pdf.

Kaplow & Shavell, *Harvard Law School Discussion Paper Nº 302 - Notions of Fairness Versus the Pareto Principle: On the Role of Logical Consistency*, (2000). Available online at:

http://www.law.harvard.edu/programs/olin_center/.

Kawashimo & Takenaka, *File Wrapper Estoppel and the Doctrine of Equivalents in Japanese Courts, (2000) 7 CASRIP Newsletter.* Available online at:

http://www.law.washington.edu/casrip/newsletter/newsv7i2jp3.pdf.

Kotler & Hamilton, *A Guide to Japan's Patent System*, A Report for the U.S. Department of Commerce Office of Technology Policy Asia-Pacific Technology Program, (November, 1995). Available online at:

http://www.technology.gov/Reports/JapanPatent/pages.pdf.

Kumagai, *History of Japanese Industrial Property System*, A Joint Production of the Japanese Patent Office and the Asia-Pacific Industrial Property Centre (1999). Available online at: http://www.apic.jiii.or.jp/facility/text/1-07.pdf.

Kumakura, *Quicker and Less Expensive Enforcement of Patents: Japanese Courts*, CASRIP Symposium Publication Series Number 5 (July, 2000). Available online at:

http://www.law.washington.edu/Casrip/Symposium/Number5/pub5atcl5.pdf.

Lanjouw & Lerner, *The Enforcement of Intellectual Property Rights: A Survey of the Empirical Literature*, NBER Working Paper Nº 6296, Dec. 1997. Available online at:

http://www.nber.org/papers/w6296.pdf.

Lanjouw & Schankerman, *Stylised Facts of Patent Litigation: Value, Scope and Ownership*, NBER Working Paper Nº 6297, Dec. 1997. Available online at:

http://www.nber.org/papers/w6297.pdf.

Lanjouw & Schankerman, *Enforcing Intellectual Property Rights*, NBER Working Paper Nº 8656, Dec. 2001. Available online at http://www.nber.org/papers/w8656.pdf.

Lerner, *150 Years of Patent Protection*, NBER Working Paper Nº 7478, Jan. 2000. Available online at http://www.nber.org/papers/w7478.pdf.

Maskus & McDaniel, *Lessons from Japan for U.S. Patent Reform: Policy Implications of a Pre-Grant Disclosure System*, a Japan Information Access Project working paper (revised on 1st June 1999). Available online at:

http://www.jiaponline.org/publications/docs/1999/june/FINAL%20PAPER%206.1.99.pdf.

Matsumoto & Blöchlinger, *A Proposal for Harmonization of Claim Interpretation under the Doctrine of Equivalence in the United States, Britain, Germany and Japan.* Available online at: http://www.law.washington.edu/Casrip/Harmonization/ClaimDOE.doc.

Miwa & Ramseyer, *Property Rights and Indigenous Tradition among Early 20th Century Japanese Firms.* Discussion paper Nº 311 (February, 2001) of the Harvard Law School. Available online at:

http://www.law.harvard.edu/programs/olin_center/papers/311_miwa_ramseyer.htm.

Mizumoto, *Translation of a Supreme Court Decision on the Doctrine of Equivalents.* Available online at: http://okuyama.com/doc.htm.

Nagasawa, *Patent Harmonization from the Perspective of a Japanese IP Judge.* Text of a speech given at the 2002 High Technology Summit Conference University of Washington, Seattle. Available online at:

http://www.law.washington.edu/casrip/Symposium/Number8/nagsawa_text1.pdf.

Okawa, *Comparative Study on the Japanese, the United States and the European Patent Systems*, A Joint Production of the Japanese Patent Office and the Asia-Pacific Industrial Property Centre (2000). Available online at:

http://www.apic.jiii.or.jp/facility/text/1-04.pdf.

Planning Subcommittee of the Industrial Property Council, *To the Better Understanding of Pro-Patent Policy.* Available online at:

http://www.jpo.go.jp/shiryou_e/toushin_e/shingikai_e/report.pdf.

Porter & Stern, *Measuring the "Ideas" Production Function: Evidence from International Patent Output*, NBER Working Paper Nº 7891, Sep. 2000. Available online at:

http://www.nber.org/papers/w7891.pdf.

Sakakibara & Branstetter, *Do Stronger Patents Induce More Innovation? Evidence from the 1988 Japanese Patent Law Reforms*, NBER Working Paper Nº 7066, Apr. 1999. Available online at: http://www.nber.org/papers/w7066.pdf.

Shavell & Ypersele, *Rewards Versus Intellectual Property Rights,* NBER Working Paper Nº 6956, Feb. 1999. Available online at http://www.nber.org/papers/w6956.pdf.

Sonoda & Kobayashi, *Doctrine of Equivalents in Japan*, available online at:

http://www.patents.jp/Doctrine%20%82%8F%82%86%20Equivalents%20Supreme%20Court.pdf.

Sonoda & Kobayashi, *Doctrine of Equivalents in Japan after the Supreme Court Decision in 1998 on the Ball Spline Bearing Case*, (October, 1999). Available online at:

http://www.patents.gr.jp/Doctrine%20of%20Equivalents%20after%20Ball%20Spline%20Case.pdf.

Sonoda & Kobayashi, *Comments on Supreme Court Decision in Ball Spline Bearing Case.* Available online at:

http://www.patents.gr.jp/Ball%20Spline%20Bearing%20Case%20Comments.pdf.

Steinfl, *The Doctrine of Equivalents Through the Eyes of the European Patent Convention, (2000) 6 CASRIP Symposium Series: Rethinking International Intellectual Property 114*. Available online at:

http://www.law.washington.edu/casrip/Symposium/Number6/Steinfl.pdf.

Takalo, *Essays on the Economics of Intellectual Property Protection*, (ISBN: 951-45-8671-9) an academic dissertation presented to the University of Helsinki and available at http://ethesis.helsinki.fi/julkaisut/val/kansa/vk/takalo/.

Takatsuki, *Writing Patent Specifications*, A Joint Production of the Japanese Patent Office and the Asia-Pacific Industrial Property Centre (1999). Available online at:

http://www.apic.jiii.or.jp/facility/text/2-04.pdf.

Takenaka, *Infringement of Functional Claims under Japanese Patent Law*, *(1999) 5 CASRIP Newsletter*. Available online at:

http://www.law.washington.edu/casrip/newsletter/newsv5i4jp2.htm.

Takenaka, *The Doctrine of Equivalents after the Supreme Court "Ball Spline" Decision*. *(1999) 5 CASRIP Newsletter*. Available online at

http://www.law.washington.edu/Casrip/newsletter/newsv5i4jp1.htm.

Takenaka, *Osaka District Court Found Infringement under the Doctrine of Equivalents: Pharmacia & Upjohn Aktiebolag v Nippon Eli Lilly*, *(1999) 6 CASRIP Newsletter*. Available online at: http://www.washington.edu/casrip/newsletter/newsv6i1jp1.html.

Takenaka, *A Major Change for Japanese Patent Enforcement*, *(2000) 7 CASRIP Newsletter*. Available online at:

http://www.law.washington.edu/casrip/newsletter/newsv7i2jp1.pdf.

Takenaka, *The Essential Element Test Provides a big Hurdle to Japanese Doctrine of Equivalents*, *(2000) 7 CASRIP Newsletter*. Available online at:

http://www.law.washington.edu/casrip/newsletter/newsv7i2jp4.pdf.

Takenaka, *The Doctrine of Equivalents in Japan*, CASRIP Symposium Publication Series Nº 6 (2000) 125. Available online at:

http://www.law.washington.edu/casrip/Symposium/Number6/Takenaka.pdf.

Takenaka, *What Japan Should Learn from U.S. Experiences: Test of Equivalence, Means-Plus-Function Claims and Product-By-Process Claims*, *(2002) 9 CASRIP Newsletter*. Available online at:

http://www.law.washington.edu/casrip/newsletter/newsv9i1Takenaka.pdf.

Vaver, *The future of Intellectual Property Law: Japanese and European Perspectives Compared* – Text of a talk given at the Third Oxford University Academy Salon at Academy Hills, Tokyo, 13th April 1999. Available online at:

http://www.oiprc.ox.ac.uk/EJWP0999.html.

Wegner, *Patent Harmonization on the Pacific Rim*, (1995). Available online at:

http://apli.org/ftp/pacific-rim.pdf.